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Ella M. Salmonsen, medical reference librarian at The John Crerar Library, Chicago. Physicians and students of medicine have been familiar with her efficiency at the library for many years.

THE CONTENTS. The book contains two sections. Section I contains Bibliographical References from the years 1556-1933, followed by a Subject Index, Index of Reference Group Headings, Authors Index and Reference-Index. Section II contains Laws of the States, followed by cases.

There are over 2700 references listed in the book, listed alphabetically and by years.

Note these reference titles included among many for the year 1933:

Cancer: Relation between pulmonary cancer and pneumoconiosis.

Cement: Effect of cement dust upon workers.

Hygiene: Physiologic examinations in industrial occupations which inhibit respiration.

Silicic Acid: Silicic acid content of lungs in pneumoconiosis.

These are but a few of over 200 references for the year 1933 alone.

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Yet I think I could not refuse this moment to die for you, if that would save you.)"
—WALT WHITMAN.

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Low Back Pain

—*Etiology, Diagnosis and Treatment*

by

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THE subject of low back pain is both difficult and important; difficult because of the many etiological factors involved and important because of the frequency of the condition as well as because of the medicolegal implications.

In approaching these low back cases it is probably well to assume that each one has a very definite underlying pathology waiting to be ferreted out, and that we are not dealing merely with a sciatica so-called for which symptomatic treatment will suffice. With our present day understanding of the various pathological possibilities, we are certainly in a much better position to discover the true nature of many of the cases than we were even 10 years ago.

At the outset I should like to state that while in the majority of instances we may arrive at a diagnosis sufficiently satisfactory for a working hypothesis, there are many cases in which even after careful study we must confess a doubt not only as to the nature of the lesion but as to its exact location as well. Not infrequently also a combination of lesions adds to the difficulty. The importance of remote foci of infection, postural defects, marked anatomic variations from normal and neurological conditions must always be kept in mind as primary or secondary factors in the production of symptoms or perhaps in aggravation of symptoms after injury. The most frequent seat of trouble is without doubt in the lumbosacral, less often in the sacro-iliac and low lumbar regions.

Goldthwait pointed out long ago that the lumbosacral region is subjected to great stress because it represents the junction between the very mobile lumbar spine and the fixed pelvis. In his pioneer studies he also called attention to the fact that the lumbosacral joint is a very weak joint mechanically, and that the frequent anomalies which admittedly predispose to strain are probably due to the fact that in the process of evolution the latest important postural change, the assumption of the upright position, has not as yet been adequately compensated by suitable anatomic structural changes.

SYMPTOMS. These patients come to us complaining of pain which may be local in the low back or referred down the extremities. This pain is usually aggravated by activity, especially lifting and stooping. Recumbency often relieves pain in lumbosacral lesions, presumably because of elimination of weight bearing. In sacro-iliac strain there is often a history of aggravation of symptoms in the early morning hours. Goldthwait reasoned that as a result of gradual relaxation of ligaments the lumbar lordosis becomes effaced and the sacrum rotated on a transverse axis, the upper end moving backwards. During the first hours of sleep the discomfort is not sufficient to arouse the patient to consciousness, but as strain continues he is finally awakened by the gradually increasing pain. Recurrence or aggravation after incomplete recovery is frequent. Many of the industrial patients have an associated neurosis expressing itself in apprehension that their earning capacity is greatly and permanently impaired.

ONSET. The onset is usually in middle life. Low back pain of the type under consideration is almost unknown in children. This is due to the fact that in childhood the epiphyses are still open, thus permitting the spine and pelvis to absorb stresses and strains more effectively.

POSTURE. Defects of posture are of prime importance as pathological factors. In a patient with large pendulous abdomen and increased lordosis it will be readily understood that superincumbent weight must be transferred in greater degree than normal to the lumbosacral facets. Dr. Lloyd Brown, of Boston, has emphasized the importance of what he speaks of as fac-

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* Presented before the Joint Meeting of the Central States Society of Industrial Medicine and Surgery and the Institute of Traumatic Surgery, Chicago, February 26, 1935.

tors of safety in joints. This has special significance for the lumbosacral articulation. A normal range of motion in flexion and extension at this joint is only possible if the habitual position corresponds roughly to the midposition. If the spine is habitually held in hyperextension as it is in patients with extensive lordosis, then only slight additional extension will cause the normal limit to be exceeded with resulting mechanical block, pain and disability. Habitual hyperextension means a shifting of the articular facets, one upon the other, with consequent narrowing of the intervertebral foramina and the possibility of pressure on the spinal nerves as they pass through these openings.

OCCUPATIONAL STRAIN. Occupational strain should always be thought of as a possible cause of low back pain. We know that we are apt to develop backache when we slouch in Pullman chairs or automobile seats, especially during long rides. Slouching posture at desk or work bench must inevitably reduce the factor of safety in the joints in question with resulting fatigue and joint strain. Flat foot is a common source of trouble, not infrequently intimately related to low back pain. In general one may say that any long continued deviation of body weight and consequent shifting of the center of gravity from normal is accompanied by strain and that this naturally predisposes to injury. Posture should, therefore, always be given careful consideration and deviations from normal corrected if possible.

TRAUMA. As an exciting factor trauma occupies a position of very considerable importance. This may be minor or major in character. Under minor we would have in mind lifting strains with tearing of a few fibers of ligaments or muscles controlling especially the lumbosacral joint and the corresponding facets with the result of pain and spasm, and presumably traumatic arthritis. Occasionally, as Lowman, of Los Angeles, has pointed out, the x-ray will disclose calcification of the iliolumbar ligaments extending from the fourth and fifth transverse processes to the crest in the iliac. When there is tenderness at these sites it must be assumed that these ligaments have been under strain sufficiently great to produce symptoms. In major injuries, such as fractures of vertebral bodies or of the transverse processes with incomplete restoration of form, disturbance of function and pain are, of course, quite likely.

DISPLACEMENT OF THE INTERVERTEBRAL DISCS. Displacement of the intervertebral discs as a cause of low back pain has been described by Dandy and others. A brief report of one of our own cases of this type may be of interest. The patient, a man of about 45, while assisting in lifting an automobile truck from its chassis, experienced a sudden extreme pain in the low back just as he set down his load, but he was able to continue at work. Several weeks later, on getting out of a warm bath and walking across the bathroom floor, he suddenly felt as though someone had hit him in the back with a baseball bat and he fell to the floor. When I saw him a few days later there was marked and extensive paralysis of both legs. On the basis of Dandy's description of the condition, a diagnosis of slipped intervertebral disc was made. Because of failure of conservative treatment, including traction, a laminectomy was performed at which a definite hump was discovered projecting into the neural canal at the level of the interspace between the fifth lumbar and the first sacral vertebrae. Removal of the mass from in front of the cauda equina was not feasible because of the patient's general condition so that decompression and continued traction were relied upon. As a matter of fact, he did improve considerably but not sufficiently to satisfy us, so after a period of three months of traction we decided to re-operate. In exposing the region, however, it was found that the mass had disappeared. In other words, during the period of traction the slipped disc had gradually found its way back to its normal site. This man has made a fair recovery; he is able to attend to his work as manager of a garage, but his physical activities are still considerably restricted.

OTHER CAUSES. Aside from the traumatic lesions described, there must always be kept in mind chronic hyperthrophic joint changes as well as the specific arthritides, tuberculous, Neisserian, and other infections, metastases due to malignancy elsewhere, and pelvic disease in women. In the diagnosis of the specific types of arthritis the symptomatology and general physical signs, laboratory findings and x-ray studies must be relied on. Sacral metastases secondary to carcinoma of the prostate deserve special mention. The primary tumor may exist in the prostate for a long time without producing any localizing symptoms so that it is not an unusual experience to have the x-ray give the first clue to prostatic malignancy because of the rather characteristic bone changes in the sacrum and ilia.

As regards pelvic disease in women, I think it is fair to say that useless operations for backache erroneously attributed to malposition of the uterus are far less frequent than they were years ago. Retroflexion and retroversion are so frequent that there are those who wonder what is the normal position of the uterus. If there is malposition of the uterus one should not hold it responsible for low back pain until examination by orthopedic methods has ruled out skeletal irregularities and mechanical derangement.

EXAMINATION. Since the diagnosis in low back cases is often difficult, a thorough systematic examination should be made in order to assemble all available facts. Inspection will disclose postural defects, such as increased or diminished lordosis, scoliosis, inequality in length of legs, list to one side, flat feet, knock knee, and other deviations from normal. Local spasm of muscles and tenderness should be carefully noted. In lumbosacral lesions tenderness is apt to be directly over this joint, often more marked on one side; in sacro-iliac lesions tenderness is more apt to be at the lower border of the sacro-iliac joint near the posterior inferior spine where the joint is more accessible to the palpating finger. Magnuson offers the valuable suggestion of checking and rechecking tender points and marking them with different colored crayons as an aid in detecting the malingerer and the neurotic.

In testing spinal motion we should fix our at-

attention particularly on the lower lumbar spine. Whether the patient can or cannot touch the floor means nothing, because hip flexion may compensate for a stiff low back. The motion of the hips should always be examined because not infrequently there may be a hip lesion which is not suspected. The only advantage we see in carrying out the motions of the spine in the sitting posture is that in sacro-iliac involvement motion is more free sitting than standing. That is, if the patient has a sacro-iliac strain and he bends forward, he will be limited considerably in the standing position. If he is in the sitting position, due to relaxation of the hamstring muscles, he can bend the spine much more than when standing.

GAIT. In the normal gait the pelvis is raised on the side of the advancing leg so that the corresponding foot may clear the ground. Since the trunk is maintained erect, there is a compensating lumbar curve to the opposite side. This requires a constant play in the sense of side bending of the lumbar spine to right and left alternately, a constant equilibration.

In lumbosacral lesions this equilibrating motion of the lumbar spine is lost but there is less apt to be a limp because a limp would not assist materially in shifting the weight to non-sensitive portions. In sacro-iliac lesions the equilibrating movements, while somewhat limited, are less interfered with than in lumbosacral. A limp is more apt to be definite because of the effort to shorten the painful weight bearing period on the affected side.

In addition to ordinary walking, it is well to have patients walk on toes, which they usually do better than walking on the whole foot because the added spring in the toe walk relieves the jarring; heel walking is apt to accentuate peculiarities in gait for the reason that the jarring is increased. Walking on the outer borders of the feet and on the inner borders is usually added since it gives one a fair idea of muscle power, flexibility or rigidity of the feet, as well as of the patient's cooperation. In addition, the patient is asked to hop the length of the room first on one foot and then on the other. This will accentuate disabilities already noted. If the lumbosacral region is involved, he is likely to hop poorly on either leg; if one sacro-iliac joint is affected, he will hop poorly on the affected side and well on the opposite side. Considerable help is obtained in these walking and hopping tests in determining whether or not the patient is cooperating wholeheartedly. If weakness is shown in isolated muscle groups in these tests, further study is indicated to eliminate neurological conditions, including spinal tumor. Inconsistency in muscle power tests should lead to suspicion of malingering.

Among other tests of value in differentiating between lumbosacral and sacro-iliac lesions there should be mentioned especially attempts at separation and compression of the iliac crests and the hyperextension test described by the writer some years ago. If these tests are positive, i. e., if pain either local or referred, is elicited by these manoeuvers, sacro-iliac disturbance is indicated. Negative tests are of little value.

The localization of referred pain has not given us information which we regard as very helpful, although we are more apt to think of sacro-iliac lesions when the pain is referred down the back of the thigh and outer side of the leg and foot, and of lumbosacral lesions when the pain is referred down the front and outer side of the thigh. However, the studies of Steindler, Wentworth, and Herndon show that the same type of radiation may be found in both types of lesions.

The roentgenogram is a very important aid in diagnosis. Great progress has been made in the last few years. The anteroposterior views should always be stereoscopic. In addition there should be not only lateral but also right and left oblique, or quartering, views, stressed by Ghormley to disclose the relations and irregularities of the facets.

X-rays should be studied systematically to avoid overlooking any evidence of pathology.

ANOMALIES OF THE LOWER SPINE. The association of anomalies of the lower spine with low back pain is so frequent that deviations from the normal are commonly regarded as predisposing to weakness and strain. Where a large transverse process articulates on one side with the sacrum or ilium or with both, abnormal strain on certain movements may be assumed. That a process not actually articulating but long enough to contact with the sacrum or ilium during certain movements may cause pain is also self evident. Side bending under such circumstances may readily cause pain. Impingement, however, must not be taken for granted until stereoscopic x-rays or, better still, x-rays taken at 45 degree angle, show that the parts are close enough together to actually come in contact, at least in certain conditions. I believe these cases are rare.

Impingement, of course, is more likely in cases of deeply seated sacrum in which case the fifth lumbar may lie entirely below the level of the crests.

SPONDYLOLISTHESIS. While this condition was first described by an obstetrician, orthopedic literature shows many more references to the subject in recent years than does the obstetrical. In patients with markedly increased lordosis, there is a shifting of the body weight to the posterior half of the bodies of the vertebrae and to the facets. When these facets are strong, well formed and normal in their anatomy, nothing may happen, but if there should be a defect in them there is a gradual giving way and slipping of the fifth lumbar vertebra forward and spondylolisthesis develops. It is recognized by increased lordosis, by prominence of the first sacral spinous process, local tenderness and impaired mobility. A transverse sulcus extending across the back just above the crest of the ilium due to shortening of the back is often noted. Lane, of London, was of the opinion that spondylolisthesis was due to elongation of the laminae. I have never seen an x-ray or vertebra showing the laminae elongated. It is generally assumed that spondylolisthesis is possible only when there is a defect in the laminae. The diagnosis of defective laminae or so-called separate neural arch is not easy and certainly not from an x-ray point of view.

In discussing this with Dr. Todd, Head of the Anatomical Department of Western Reserve University in Cleveland, he said that they had x-ray-

ed a large number of cadavers in an effort to discover separate neural arches and could not find them. In some instances the separate neural even eluded discovery during dissection and were found only after assembling the parts after preparation of the skeletons. This shows that, even when you are on the lookout, it is difficult to find them.

The importance of lesions about the facets in relation to low back pain is being realized more and more. Goldthwait, in 1912, in his studies called attention to the fact that the sacro-iliac joint was a very weak joint; that if it were not for the facets the fifth lumbar would readily slip down. The facets in the coronal plane offer more security than those in the sagittal plane. Not infrequently you find facets in the sagittal plane on one side and in the coronal plane on the opposite side. The asymmetry of the facets must be regarded as evidence of potential weakness. Emphasis is also laid on the fact that the articulations formed by the facets are really true joints; that the facets are covered by cartilage; that there is a synovial membrane and a capsule, and that these are subject to all the stresses, strains and diseases that any joint is subject to. It is readily understood that if you have any injury to such a joint as from a fall, a twist or a blow, an effusion into the joint and all the symptoms usually associated with arthritis may develop. In a patient with marked lordosis you may have spurs forming around the facets, erosion of cartilage and thinning of the joint space, so well described in Chandler's excellent monograph, and all the changes that go with our conception of chronic traumatic arthritis. When these facets slip by one another, as they do when the ligaments are overstretched or torn, it is easy to see that the foramina may be narrowed to a certain extent. Danforth and Wilson have called attention to the fact that between the fourth and fifth the foramen is smallest, whereas the fifth nerve is the largest one, so that a comparatively slight narrowing of the foramen may cause compression of the nerve. The Germans do not believe that the actual encroachment on the nerve by narrowing the foramen is likely. They do not say it does not occur, but believe it is certainly an unusual occurrence. They feel that even though there may be considerable narrowing, there is still sufficient space for the nerve without danger of pressure.

Spina bifida occulta in my experience is not responsible for backache though it may predispose to injury. In a patient operated recently a spina bifida occulta with defect involving the upper three sacral segments was present. The tips of the posterior spinous processes formed a loose mass somewhat resembling a date seed in size and shape, pressure upon which from a chair or even when lying in bed was directly communicated to the nerve roots lying in the neural canal with resulting severe pain.

NUCLEUS PULPOSUS. Collapse of the nucleus pulposus is a relatively new finding. Up to within a few years ago we did not pay much attention to the intervertebral discs. We thought of them merely as cushions or shock absorbers of the spine. Now we know that the discs, and especially the nucleus, may be the seat of definite pathology of interest to the orthopedic surgeon. A good deal of work has been done by Schmorl and Junghans in Germany, and in this country by Williams, Compere and others. As a result of injury there may be a caving in of the cartilage plate of a vertebra and a herniation of the nucleus pulposus through the defect into the cancellous bone of the body. As a result of the escape of the nucleus pulposus the cushion becomes thinner and the body of the vertebra above settles on that below, and you have again the facet syndrome because you cannot have a lowering of the body without having a shifting of the articular processes one on the other. Not only that, but the bodies themselves come into closer contact. On one side or the other extending along the articular margin of the vertebrae, the occurrence of spurs will be noted which may give rise to pain on certain movements.

HORIZONTAL SACRUM. The so-called horizontal sacrum is another factor in the production of low back pain. In this condition the weight of the body is shifted posteriorly. The sacrum will, therefore, have a tendency to rotate on a transverse axis, the upper end forward and the lower end backward, giving the sacrum a much more horizontal position. Not infrequently, however, one finds a horizontal sacrum in cases in which there is no increased but a diminished lordosis. German writers have attributed this to a rachitic deformity. I have never warmed up to that conception, but I have no other explanation to offer. The weight will be borne largely on the facets and on the posterior margin of the vertebra. The condition has been called reversed spondylolisthesis because here there is no slipping down of the fifth lumbar on the sacrum but a creeping of the sacrum under the fifth lumbar.

SUPERNUMERARY FACETS. Supernumerary facets have been noted in two of our cases. They should be regarded as predisposing to weakness and, therefore, to prolongation of symptoms after injury.

MYOFASCITIS. There is one other group that I would like to call attention to that has been called by Albee myofascitis. He believes that in 90% of low back pain cases the difficulty is due to this condition. It is characterized by tenderness, more diffuse than that found in the lumbosacral or sacro-iliac lesions, and associated with signs of toxemia, such as headache and general malaise. He believes that the colon is largely responsible for this and stresses the point that it is not a forgone conclusion that because a patient has a bowel movement every day there may not be an intestinal toxemia. There may be general sluggishness all along the tract. The treatment, he believes, should be colonic lavage, examination of the intestinal flora, and a modification of this when found necessary. This reminds me that Ridlon years ago said he had cured many a patient with low back pain with senna tea.

One of the vexatious questions is the relation of a previously existing hyperthrophic arthritis to symptoms following an industrial accident. This is sometimes a very difficult question to settle. German writers have stressed the following points—acceptable evidence must be adduced

to show that a pre-existing arthritis has actually become aggravated more rapidly after the accident than would have been expected in the absence of trauma. Reference is here made particularly to increase in spur formation, and this increase must take place within a reasonable time, probably in the neighborhood of six months. Furthermore, a simple lifting effort no greater than is incidental to the ordinary routine work of the employee is not regarded as an accident. In this country we are apt to accept as an injury due to accident the apparently minor lesions resulting from simple lifting strains on the basis that an employee appeared perfectly able to do certain work day after day while after injury as described he is unable to carry on. It is certainly logical to care for him during the period of the acute disability, but it does not seem quite reasonable to charge industry with months and often years of invalidism arising from minor accidents. Employees approaching the end of their period of usefulness and younger individuals with predisposing low back anomalies must be regarded as especially vulnerable, liable to prolonged disability following such minor strains as, for example, are incidental to stoking a furnace or shoveling snow.

TREATMENT. Determination of the etiological factors involved will usually indicate the general lines of treatment. Postural and occupational strains should, of course, be avoided or corrected. A short educational talk on posture, including attention to proper seating and avoidance of slouching positions, especially reading in bed, is helpful in securing intelligent cooperation of the patient. Exercises, belts, and corsets all have their proper place. Adhesive plaster strapping across the low back sometimes reinforced by longitudinal straps running from the root of the neck to the sacrum is a great help in relieving the erector spinae muscles from strain. In the more severe cases bed rest with traction and suitable support in the small of the back is often useful. Corsets to support the back and to limit motion are often indicated.

Manipulation of the spine under anesthesia should be thought of as a therapeutic measure in order to stretch contracted tissues on the same principle that applies in the treatment of spastic flat foot by manipulation.

Impinging processes in our experience are rather rare occurrences and may require removal. Moore prefers to remove a portion of the iliac crest as a much simpler and effective operation. Ryerson, I believe, was the first to fuse a spine for spondylolisthesis, the only logical procedure once the condition is recognized. This operation is also indicated in the various congenital anomalies, collapse of the nucleus pulposus and chronic arthritis with the facet syndrome, if the indications as laid down by Chandler and others are followed. A reasonable period of conservative treatment should always precede a major operation of this type, but once it is recognized that conservative measures fail, operation should not be delayed.

Discussion

DR. EDWIN W. RYERSON, Chicago: We can all subscribe very thoroughly to Dr. Gaenslen's excellent paper. The practical side of these low back pains is one of the most interesting things I know. I am sorry that Dr. Gaenslen did not place more stress on these curious mechanical lesions that occur so frequently. For instance, yesterday a young woman, about 26 or 27, came into my office and said she had very severe pain in the low back which had been bothering her for three weeks. She said that she was sitting on a chair putting on her shoe when this excruciating pain came on. I do not see many typical sacro-iliac sprains, because as Dr. Gaenslen very wisely said, the majority of these low back pains are lumbosacral instead of sacro-iliac. This young woman had marked tenderness over the sacro-iliac joint, and when Dr. Gaenslen's test was applied the left sacro-iliac joint reacted to the strain each time. I concluded that she has a definite sacro-iliac sprain from the simple motion of leaning over. We have all seen patients who develop such pain from pushing up a window. It was a pleasure and a surprise to me to find so clearly differentiated the question of sacro-iliac strain in this young woman. There will always be difficulty in the diagnosis, I think, until we arrive at some more perfect means of diagnosis.

These curious mechanical affairs occur quite frequently in my experience. I do not believe any of them are myofascitis, as Albee calls it, because they come on with a definite mechanical strain. In a few cases the pain is delayed until the next day, but there is always a definite history of some degree of pain in the low back. Some of them probably are sacro-iliac, but most of them are lumbosacral. The great trouble is that we cannot make a dissection of these cases because these patients do not die of simple strain in the back. They suffer a great deal but they do not die, and nobody has ever dissected down on a low back because of these sudden injury cases. We do not know whether it is, as Dr. Gaenslen states and as other men suggest, a tearing of some of the ligaments, which is very plausible, or some very minor degree of displacement. I believe both lesions may occur. Years ago I went to Baltimore and saw Baer do his forcible stretching in cases of low back pain. I have done that in a number of cases with complete and perfect relief. Whether the relief is due to overstretching I do not know. Sometimes the pain is delayed a little while, and in many cases it does not reach its maximum for 24 hours. Fiske of Pittsburgh suggests that the forcible manipulation may stretch out this swollen and painful area. Another explanation is that there is a slight displacement which is reduced by this manipulation. Many of these patients are relieved by the manipulations, and that is why sometimes the manipulations of chiropractors and osteopaths give them relief. I think we have often neglected something that we should try to do for these patients.

One other thing which Dr. Gaenslen mentioned, is the impinging process of the fifth lumbar vertebra. It is not wise or sensible to remove this process. It is far better to do a fusion operation and fasten the fifth lumbar to the sacrum, because unless you have tried it you have no idea how difficult it is to get down to this enlarged transverse process which articulates with the sacrum and never articulates with the ilium. It is extremely difficult and formidable to do that. In two cases in which I tried it, it was not possible to remove this transverse process successfully, and subsequently spinal fusion cured the patient entirely.

DR. F. M. CLOYD, Danville, Ill.: We hear so much of slipped sacro-iliacs and strain of the sacro-iliac joint. After seeing a number of cases of fracture of the pelvis in which one side is entirely loose and slipped up two or two and one-half inches, and the pelvis is pulled back into normal position and the patient given time to recover, I have yet to see one case that complained of backache or of sacro-iliac pain, and yet there was a displacement upward of two or two and one-half inches, and then to see a man slip over a piece of coal and be laid up with terrific pain, and a diagnosis made of sacro-iliac strain, it is hard to explain. I think our greatest difficulty has been the poor results of roentgenological examination. Dr. Chandler has shown some and the Mayos have had some in which they got very wonderful results. I do not know whether your hospitals in Chicago have good technicians. In the October number of the **Journal of Bone and Joint Surgery** there was a splendid paper on spondylolisthesis. I think there are very many more cases of this condition with slight slipping of the fifth lumbar vertebra on the sacrum than there are of real sacro-iliac strain or sacro-iliac slip. That is borne out by these cases of very severe trauma of the sacro-iliac region that I have seen.

I have seen quite a number in which one side had slipped up two and one-half inches. When put back in position, the patient recovered and had no trouble six months after.

DR. GEORGE L. APFELBACH, Chicago: I have handled back injuries for a general chain store for seven years. We have an enormous number of back injuries following lifting of heavy weights and heavy boxes. I have a routine method of treatment. The patient comes in because of a back injury. Dr. Gaenslen brought out one point, namely to find out what the man has done before the injury. He has lifted a 100-pound weight and suddenly has a pain in the back. The man is sincere, he thinks he has injured his back. Eight out of 10 of these are lumbago. We find no spasm of the muscles of the back. We put him on aspirin, without examining him, order Epsom salt baths or the ironing method, and say come back. If he comes back and feels better he is sent back on the job. If he comes back and still has pain, I put him through Menell's tests. I photographed every one of these tests, for office use, and put them on a card. In addition to Menell's test, I put him through Dr. Gaenslen's test. If there is an arthritis present I know I am up against it from the Compensation Board. If he has no arthritis and but a sacro-iliac strain, I put him in the hospital and put on an extension for 10, 12 or 14 days, and then provide him with a Goldthwait belt, and put him back on the job in a week or 10 days after that. If there is nothing in the x-ray and a man has indefinite lumbosacral pain and does not get better after two weeks, I put him in the hospital, call in his wife to learn something of his background and find out whether he likes to work. If he does not like to work, there is nothing like a bread and water diet to make him get better and he will tell you, "I am better tonight," and ultimately that man will get better. That is the only way to handle that type: hospitalization, starvation, milk, water, until he finally decides that his back is better, and work more agreeable.

In regard to the congenital anomalies, spinal bifida occulta and abnormal fifth lumbar vertebra, as far as we industrial surgeons are concerned, we are stumped; we might as well settle with the man.

Dr. Scuderi in the last two or three years brought back from Vienna Boehler's method of treatment in compression fractures of the spine. We have tried it out in the County. I have tried it in private practice and have had bad results. The insurance company will not allow any operations on the spine. Personally, if I were a private patient and had a fracture of the laminae, I would allow operation. As long as our industrial boards are made up of politicians, we will not be allowed to do operations. I am firmly convinced that, in bad back pain caused by compression fracture of the spine, manipulation by the method of Boehler and Scuderi is dangerous in some cases and bad in others. Getting them up in three weeks is out of the question. I agree with Dr. Ryerson that it takes a year. As long as that is the case, you might as well figure a year's disability and keep the man off his feet.

DR. HARRY E. MOCK, Chicago: The thing that struck me in this talk was that we must be very careful not to overlook hip lesions in these low back pains. The hip joints are frequently not suspected when backache is present. A second point is, that the presence of malignancy is frequently overlooked as a cause of low back pain. I recall a case referred to me by a doctor in one of the western suburbs. The man slipped on the ice, fell and injured his back. He reported to the doctor who strapped the back. He came back in a week still complaining of pain, and an x-ray was made which was negative. Finally at the end of five or six weeks he thought the man was able to go back to work and sent him in to me for examination. The man was a teamster, 63 years old, and entitled to a pension at 65. His almost exaggerated expression of pain made me think he was a malingerer. I went over him quite thoroughly and found nothing except variable points of tenderness in the spine. I finished my examination without arriving at a diagnosis. I dictated my findings while the man was dressing. I have a routine form, and when I got down to the prostate, it occurred to me that I had not examined it. I put him back on the table, examined the prostate and found it hard and enlarged. I sent him in to Potter for an x-ray. This showed a metastatic carcinoma in the spine. This shows the necessity of being thorough in your examination. If I had not examined the prostate, I would have branded that man as a malingerer.

Another man fell off a train and hurt his back. He had pain in his back and sciatica. He stayed around home for a while but did not get better, then consulted a doctor. The doctor treated him for about 10 weeks for sprain of the back. It was not getting any better, and he limped when he walked, so he was sent to another doctor who took an x-ray, which showed a fracture of the neck of the femur. That was three months after the accident. He was sent to Baltimore, was examined there, and kept at rest for a month and was then told that he could go home and begin gradually to use the leg. I saw this man 13 months after. He had been declared a total disability case. Diagnosis at this time was ununited fracture of the neck of femur. At that time we discussed the question of whether the head was viable. After studying this case I decided to operate. I made a typical incision for a Brackett procedure and exposed the head. I freshened the head and it bled, so I felt it was vital. I rounded off the trochanter and fitted it onto the head and put it up in plaster. He was operated 13 months ago; he is now ready to return to work as a shop foreman on one of the eastern railroads.

This was one cause of low back pain that was overlooked.

I think this illustrates just what Dr. Gaenslen said, that we do have conditions that are not always low back pain, but are sometimes in the hip joint or in some other joint.

DR. ARTHUR E. CONLEY, Chicago: One point I would like to stress is that operations on the spine from the standpoint of an institution like the County where everything is free and all the x-rays are free, seem to be more successful. You take a medicolegal case and operate for low back pain and the patient gets worse. I am rather at a loss to explain this. Possibly the operation was done as well on the private patient as on the charity case. Unless there is some very definite gross pathology, such as fracture or compression or something demonstrated objectively that we may put our finger on and say this is the cause of this man's complaint, I have come to the conclusion that doing a fusion operation on a patient without objective findings, or on one who has even a remote medicolegal reference to the case is not a procedure of choice.

DR. FREMONT A. CHANDLER, Chicago: There are two points which I wish to emphasize. The first is the great frequency of separate neural arches occurring in the lumbosacral region. The work done by Willis in the analysis of this pathological condition is outstanding. The clinical recognition of this condition during the past few years has been increasingly widespread, and its frequency is rather appalling. Although there is still considerable difference of opinion as to the origin of this defect and the weight of opinion points to a congenital origin, this fact is by no means settled. It is entirely possible that this defect results from trauma during childhood or later life, and that it is frequently accentuated to produce symptoms is well recognized. Willis found such a defect occuring in nearly 4% of the spines examined postmortem.

I have a series of 68 cases in which this defect has been demonstrated clinically and in about one-half of these cases this finding has been confirmed by operation. The majority of this series traced their symptoms to a very definite trauma.

The greatest aid to the recognition of this condition is first, a thorough examination of the area involved and second, a lateral roentgenogram of the lumbosacral area of a quality that would reveal the fine details of bone structure.

The second point is that most of us fail to recognize that the lateral articulations of the vertebral column form true joints. These joints are about the size of those in the thumb. Their surfaces are covered with hyaline cartilage. These are surrounded by synovial pouches and by capsular ligaments. As such joints are the most sensitive structures in other parts of the body, it is reasonable to believe that they are the most susceptible elements in the low back. Acute synovitis may follow minor traumas by direct or indirect force involving the structure of the lumbosacral region. Such a synovitis may account for many of the symptoms of the low back and especially those that have been grouped under the indefinite class of lumbago. This type of pathology may also account for the relief that may follow manipulation of this region. Manipulation may result in the rupturing

of the synovial tissue and a release of the accumulated synovial fluid. The proximity of such irritated synovial spaces to the roots of the lumbosacral plexus undoubtedly accounts for many of our cases of sciatica. I believe that sciatica is rarely produced by bony pressure upon the nerve roots for we seldom see complete nerve degeneration of a progressive type producing this symptom. Sciatica usually fluctuates in its intensity and probably is the reference of irritation arising from the synovial area and similar in many characteristics to that referred from an inflamed bursa.

DR. FREDERICK J. GAENSLEN (closing): I am inclined to agree with Dr. Ryerson that the treatment for impinging transverse process is probably fusion, at least in those cases in which impingement is only one of several possible factors. If impingement of a process appears to be the sole cause of trouble one would prefer to avoid a fusion. I have not removed many and hope I will not have to, because removal of a transverse process is a difficult operation. I think the fusion operation is probably the operation of choice. It is considerably facilitated by carrying out the suggestion Hibbs made some years ago, namely to put the patient in the prone position with the hips flexed to diminish the lumbar lordosis.

The only important feature is that after you expose the area and thoroughly denude the parts, and then put in bone chips, you bring the legs up again so that the normal lordosis will be restored, otherwise the bone chips will be disarranged.

Some of the most difficult problems are in connection with minor injuries. We do not know what happens in the back when the patient has a sudden strain. Like Dr. Chandler, I am willing to admit that I do not know what lumbago is. It may merely be a synovitis that comes on as a result of injury of the facets. We are indebted to the radiologist for much of the progress that has been made.

When we compare our knowledge today with that of 20 years ago we realize that we have made very substantial advance.

X-Ray Diagnosis of Carpal Fractures and Dislocations

By C. H. WARFIELD, M.D.*
Roentgenologist to the Cook County Hospital, Chicago

THE diagnosis of fractures and dislocations of the carpal bones is, at times, difficult to analyze or even to diagnose. Many doctors do not know the names of the carpal bones and few realize that each carpal bone has a definite relation, one to the other, and that they are always in the same place in the wrist. The shape of each individual bone is quite uniform, which makes them so easy to identify. The only bone that has a tendency to change in shape is the navicular, and, due to its changes in shape, fractures may be frequently overlooked. It is important that the roentgenologist be so familiar with these bones that at no time is he in doubt as to any one of the bones even if they should be markedly dislocated.

The position of the hand to best demonstrate a fracture of the navicular is important. The hand should be placed in marked ulnar deviation and a P. A. view taken. This should be followed by a perfect lateral view, the lateral side of the wrist down on the plate so that there is little distortion of the navicular.

It may be difficult in the beginning to identify all the bones of the wrist in the lateral view, yet this view is more valuable than a stereoscopic view. In fact, I believe that the stereoscopic view is of little value in studying the wrist. Dislocations can be diagnosed without the lateral, if one is acquainted with the position of the bones.

Anomalies of the carpal bone are not common. The lunate bone may be extremely large overlapping the triangularis. Absence of one or more of the carpal bones is occasionally seen. I have had the occasion to see one case of a bilateral bi-partate navicular bone in which there was no history of injury. The two pieces of bone were in contact but smooth and rounded. A sesamoid bone may develop in the region of the lateral surface of the navicular and could be mistaken for a chip fracture.

The late Dr. Hickey called attention to three major injuries to the wrist in the order of their frequence, namely:

First, fractures in the lower third of the radius and ulna and epiphyseal separations;

Second, fractures of the navicular; and

Third, dislocation of the lunate.

A small chip fracture of the posterior surface of the triangulars is occasionally seen in the lateral view.

The fracture of the lower portion of the radius is easily seen, yet one must be familiar with the fact that the articular facet must face directly downward or slightly forward. This deformity will cause limitation in flexion of the wrist, yet it is many times left alone and not recognized as a bad deformity.

Sessamoids in the region of the styloid of the ulna are frequent and should not be mistaken for fracture, since an erroneous diagnosis here is the cause of a medicolegal case.

Slight injuries to the lower epiphysis of the radius occur but are of very little consequence and even gross dislocations, if reduced while fresh, cause no disturbance in growth. The ulnar-carpal space should be carefully observed and reported, since a lack of this space can cause serious clinical results.

The navicular bone is shaped something like a dumb-bell with a weak center portion, and is also somewhat shaped like the letter "C." This causes a weak portion so that most of the fractures occur in this area, with little separation. If the hand is placed in marked ulnar deviation the fragments can be slightly separated. If any portion of the fragments is dislocated it is usually the proximal fragment, and this may be found almost any place in the region of the wrist. Callus in this fracture is seldom, if ever, seen.

Dislocations of the lunate bone usually occur anterior with 90-degree anterior rotation of the bone, so that the concave portion of the bone that fits onto the rounded lower end of the capitate, is directed anterior and the convex surface is directed backward. This causes the convex surface of the capitate to move proximal into the lunate facet of the radius, making reduction difficult. In the P. A. view we practically always notice the characteristic triangular overlap of the lunate upon the capitate. There are several degrees of medial displacement of the lunate with medial displacement and without the anterior rotation. Owing to the fact that most of the lunate bone is covered by a slick, smooth glistening surface, it may snap completely out of position and be found beneath the muscles of the forearm. I feel sure that slight displacements of the lunate bone are

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present many times and not recognized and the patient sent out with diagnosis of sprained wrist; and the opposite is true that dislocations are diagnosed when it is the position the hand was placed in while taking the radiograph that makes apparent dislocations.

I have seen complete posterior dislocations of the carpal bones at the radio-carpal joint with reduction and good results.

Fractures of the other carpal bones are rare. I have had the occasion to see one fracture of the hamate, one of the capitate and one of the greater multangular.

Small chip fractures of the pisiform are occasionally seen.

The Treatment of Brain Injuries

By HARRY JACKSON, M.D.*
Chicago

I SHALL limit myself in this talk to a discuscussion of the treatment of brain injuries in adults, following severe trauma.

There are today five methods of treatment in vogue:

1. The *laissez-faire*, or do-nothing, policy.
2. Reduction of intra-cranial pressure by the intravenous injection of hypertonic solutions.
3. Reduction of intra-cranial pressure by repeated spinal taps, depending upon the estimation of pressure with the manometer.
4. The use of diuretics, such as caffeine.
5. A combination of the above methods.

Everyone is agreed upon the necessity of operation in cases of middle meningeal or sinus hemorrhage; in cases of depressed skull fracture producing pressure upon the brain, and in cases of continued convulsions or paralysis. It is also generally agreed that shock is to be combated in the first few hours by rest, external heat, fluids, and lowering of the head, with the administration of sedatives if the patient is restless.

Twenty years ago, when I began to study these cases, subtemporal decompression was a favorite method of treatment, but this fell into disrepute for reasons that I demonstrated in an article written at that time[1].

I am in favor of the exact determination of the intra-cranial pressure by the mercury manometer attached to the spinal needle, for this gives us first hand knowledge of the severity of the injury much better than knowledge gained by the neurologic symptoms alone, and also shows by the presence of blood whether or not the brain has been injured. This is very important in medicolegal cases. It also allows for the escape of blood from the sub-dural spaces, which is highly irritating, and by a comparison of successive estimations of pressure, is a positive guide to prognosis. The relief of pressure from below saves the medullary centers from injury, and the symptoms of slow pulse, stertorous respiration, high blood pressure and papillary edema do not appear. I am firmly in favor of this method because it has given me the best results in hundreds of cases.

I am opposed to the treatment by hypertonic glucose solutions (the hypertonic salt solutions at first used were soon given up as being too toxic) because, as I have shown in a recent report[2], these solutions are toxic, and result in a secondary rise in pressure after one to two hours.

I am opposed to the *laissez-faire* or do-nothing policy, as I believe it to be a reversion to times when we knew nothing about the pathogenesis of intra-cranial pressure; that it allows, in the severe cases, of continued pressure on the cortex and medulla, and leads to cortical atrophy, with sequelae of headache, vomiting, inability to work, or to withstand extremes of heat or of alcohol, or to a general neurosis, or death.

I am opposed to the use of caffeine, as its action to relieve pressure is only that of a diuretic, and its excites the cerebral centers and increases the congestion of the brain and the intra-cranial pressure. The extraction of fluid from the body can better be obtained by the use of magnesium sulphate per enema, or by mouth, or by injection.

Also, for the foregoing reasons, I am opposed to the combination of several methods, as they smack of "gun shot" therapy and betray a lack of confidence in any one method.

From a general study of several thousand cases seen here at the Cook County Hospital during the past 20 years, I have found that our patients fall into three groups:

First: Mild cases, with spinal pressures below 12 m.m. Hg., that recover with rest in bed, elevation of the head and the ice cap. These constitute 20% of the cases.

Second: Very severe crushing injuries of the head, with injuries to the medulla or hemorrhage from large cranial vessels that die in the first 24 hours. These constitute 15 to 20% of the cases.

Third: Severe cases with intra-cranial pressures over 12 m.m. Hg., that are unconscious for variable periods, and that require early relief from intra-cranial pressure by the direct removal of cerebro-spinal fluid to prevent cortical atrophy or medullary pressure.

I want to demonstrate one patient who was brought in from the Peoples' Hospital, where she was given first aid. She was struck by a hit and run driver on February 5th. She is about 50 years of age. On entrance she was comatose, restless, with a pulse of 110. She had a laceration of the scalp in the temporal region. There was no bleeding from the ears, nose and pharynx. We made a careful neurological examination, and a spinal puncture was done. She was given 1500 units of antitetanic serum. February 6th, on lumbar puncture, it was found that her spinal pressure was 19 m.m. mercury, and 30 c.c. of bloody fluid was withdrawn. The next day, at the second puncture, the fluid was still bloody, and 30 c.c. was withdrawn. We usually withdraw slowly, with the patient lying in the horizontal position, from 20 to 30 c.c. On the second examination, the pressure was 18 m.m. of mercury. On the 8th of February, the pressure was down to 16 m.m. It was reduced to 10 after about 15 c.c. of slightly blood-tinged fluid was withdrawn. The next pressure level was 14 m.m. on the 9th, and 10 c.c. was withdrawn. After the next tap, the pressure

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1. "The Management of Acute Cranial Injury by the Early Exact Determination of Intra-cranial Pressure by the Mercury Manometer, and Its Relief by Early Lumbar Drainage." *Surgery, Gynecology & Obstetrics*, April, 1922.

2. "Effect of Hypertonic Dextrose Solutions on Intra-cranial Pressure." *Journal of the American Medical Association*, March 11, 1933.

was practically normal, 10 m.m. of mercury. She is very much improved. There is one sequela of the injury, that is a paralysis of the third nerve on the left side. Her pulse this morning is 90, temperature 98.2 respiration 20.

This case is a good example of the severe type of severe cranial injury, and demonstrates how efficacious is the daily withdrawal of spinal fluid, which alleviates the intra-cranial pressure until the edema of the brain subsides, as it usually does in three to five days. She will be kept in bed for a period of four weeks.

Depression Fakir

By Frank P. Hammond, M.D.*
Chicago

MOST of you men know that the depression has brought with it the person who feigns illness for the purpose of obtaining money. I am certain that the men who are doing considerable traumatic and industrial surgery will recognize more fully what I am going to say than the average man out in general practice or the specialist in lines other than industrial surgery. Some three or four years ago at one of the meetings of the American College of Surgeons at the Congress Hotel, the Director General, Dr. Franklin H. Martin, made a talk on traumatic surgery and made this statement, that a large portion of traumatic surgery as a specialty was not surgery *per se*.

Let me restate it, that 75% of the work associated with traumatic surgery is not surgery *per se*.

My interpretation of that is this, that 75% of the work associated with traumatic and industrial surgery has to do with the insurance company, with the employer and with the nervous instability and emotions of the patients. During the depression, in my experience there have been more alleged injuries for which attempt was made to obtain money under false pretenses than at any previous time, and therefore I entitled my talk "The Depression Fakir," and I am going to illustrate a few cases.

I was called about 12 o'clock midnight to the Woodlawn Hospital by the intern who told me he had a man who was very seriously injured. When I reached the emergency room of the hospital the intern said the man was almost dead. As I went in I saw a man about 40 years of age, complaining of pain in the right thigh region. I laid my hand on his thigh and started to say, "What is the matter?" He began to yell, "Don't touch me." I said, "Where are you hurt?". He said, "All over." "How did you get hurt?" "I fell getting out of a cab." I said, "Some part of your body is more hurt than the other?" "I hurt all over." Then I walked over to the other side of the table, gently lifted the leg placing my hand under the knee and began to flex the knee, resulting in a no less exaggerated complaint. It was almost impossible to make any examination. His statement was that just as he was getting out of a cab he caught his toe in the rubber mat and fell on the sidewalk. You know and I know that a man does not get hurt all over from such an accident. I asked the night superintendent to get the x-ray operator. I had the intern call up the cab company's office. The x-ray was taken and showed nothing. The police were called. The policeman came in and said to him, "Those are your clothes?" "Yes." "Put them on!" He got up, dressed and walked out with the police. The company took him to court the next day and he was fined $50. The fact is that he had taken a knife and cut a corner piece in the mat. He admitted he wanted to get a little money so that he could go down to Florida.

Another man came in complaining of pain in the rectum, stating that while eating pie at a certain restaurant he swallowed something he feared was a small nail. On examination, there was a three penny nail in the lower part of his rectum. I called up the insurance company. They got a confession from him and threatened to send him to jail.

Another case was that of a man who bumped his toe and fell, and came in with pain in the back. Examination of the sacrum and coccyx showed no evidence of injury. In my estimation a man who has such an accident is going to put out his hand to save himself. The story did not ring true. I sent him over to the hospital for an x-ray and called the central office of the insurance company. Sure enough the sacrum showed an artefact or what looked like it might be a small crack in the right side of the sacrum. When the investigator came out and I introduced him, he said, "Why, I have seen you before." In five minutes the investigator had his confession and threatened to put him in jail. He said he would get out of town. This man apparently knew of a slight irregularity in his sacrum.

More recently, a man living at the Pershing Hotel claimed he fell downstairs. The story did not ring true, and there was nothing to be found on examination. I admit that you can have an injury around the hip and sacrum with not much evidence. I did not even strap him. I told him the injury was a minor bruise. I notified the insurance company. When he returned for examination, I had a photographer in the next room to get a picture of him. When questioned by the investigator he admitted the whole thing was faked.

It is not very long since one of my colleagues in the practice of medicine said, "You are working for the insurance company?" I told him that what I am opposed to is the obtaining of money under false pretenses. I am working against false and exaggerated claims. The desire to obtain money is uppermost in the minds of many people and if the doctor is not constantly cognizant of the fact he will at times yield and agree with the patient through sympathy, and permit the patient to go on multiplying his symptoms, and notably the period of disability. Just yesterday I saw a personal injury case, a lady who was trying on a dress while buying a trousseau for her wedding. As the attendant was pulling the dress over her head, the lady's face was scratched. A doctor saw the case 18 times at $3 a visit. I was sent to see the case. There was no disfigurement or disability. The scar was absolutely clean. What is this thing, that a doctor will allow himself to throw to the four winds his knowledge of physiology and pathology of processes following injury because of sympathy for the patient or because he wants to get more money? I would not have you think for a moment that I am not willing to give any

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injured man or woman full due in relation to the injury, but it behooves men who are doing industrial and traumatic surgery to be aware that money is often uppermost in the patient's mind. I have seen a great many patients come into the office and say, "They will certainly pay for this."

If I have one definite recommendation in regard to the depression fakir or any other fakir, it is that before you pass any opinion you should make an extra-thorough examination and do everything necessary from a physical standpoint in order to obtain the confidence of the patient. If he claims his right arm is injured, go over his entire body very thoroughly, and then if you find nothing wrong, with firmness and yet in kindness you can say, "You have unduly worried about this condition. It is a minor injury and the results will certainly be satisfactory in a few days."

In conclusion I would recommend that in the future on every one of our programs we should hear someone speak on malingering, so-called traumatic neuroses, the economic side of traumatic surgery, and especially the fakir.

Radial Nerve Suture (Compound Fracture of Humerus and Compound Fracture-Dislocation of Lower Ends of Radius and Ulna)

By F. W. Slobe, M.D.*
Chicago

THIS boy was struck by an automobile while riding a motorcycle about one and a half years ago. He was taken to a hospital in one of the suburbs, where immediate amputation was advised, but this was refused. He was given first aid by the local physician who sutured the wounds and applied a splint. The next day his family moved him to another hospital and called in Dr. Drury, who referred the patient to me. This was about 48 hours after the accident. The patient was septic, with considerable inflammatory reaction around both wounds. There was a compound, badly displaced supra-condylar fracture of the humerus with a T-shaped fracture into the joint; a compound fracture-dislocation of the wrist, the lower end of the ulna projecting into the wound; the radius and ulna were completely separated, with the lower end of the radius fractured transversely, with no lateral contact between the fragments. He also had a complete radial nerve paralysis. The infection, of course, precluded a primary nerve suture. We felt that a conservative way of handling the fractures and wounds would be best, so we administered a general anaesthetic, removed all the sutures, performed a gentle debridement, leaving the wounds wide open, packed loosely with vaseline gauze. The fractures were manipulated, two molded plaster splints applied from shoulder to hand with the forearm in 45-degree flexion. He was put in a fracture bed, a glove glued to the hand with perpendicular traction by weight and pulley with a sand-bag over the lower part of the arm. He was left that way for four weeks, during which time the wounds were not dressed as his fever gradually subsided. When the splints were removed both wounds were healed completely except for a small sinus above the elbow which healed in a few weeks. The paralysis was unchanged so the wrist was kept in a cock-up splint and massage, motion, and physiotherapy were instituted.

Four months after the injury we exposed the nerve, finding both ends embedded in dense scar tissue for a distance of about one inch. The scar was excised together with the involved portion of both ends of the nerve and suture performed with fine silk. It was necessary to free both ends of the nerve and completely flex the elbow first. Functional return began gradually after six months and he now has complete extension of the wrist and fingers; there is a small area of diminished sensibility on the radial aspect of the dorsum of the hand. There is moderate impairment of thumb abduction which is a common sequel after an otherwise successful radial nerve suture. Supination is largely lost due to synostosis between the lower ends of the radius and ulna.

It is practically impossible to differentiate between an anatomical division of a nerve and a physiological interruption of continuity. Of course, primary suture is preferable, but in badly contaminated wounds where a complete debridement is not feasible or in patients seen late where infection is beginning, primary suture should not be performed. Where infection has supervened one should wait from two to six months after the infection is healed before doing a nerve suture. Of all nerves paralyzed by fractures the radial is most frequently involved. Fortunately (perhaps due to the preponderance of motor fibres) the prognosis is good following suture of this nerve.

This patient has excellent motion in the elbow except for some interference with complete extension. Wrist motion is excellent, but there is a very marked limitation of supination due to a synostosis between the lower ends of the radius and ulna. An interesting aspect of this case is the subsidence of infection and complete healing of the wounds by the use of the Orr method.

Bilateral Peri-Renal Abscess

By F. W. Slobe, M.D.
Chicago

ON JUNE 10, 1930, I treated a patient for a mild suppurative olecranon bursitis which healed in about seven days. I did not see him again for three months. In the interim he stated he had developed fever and soreness in the left abdomen and loin which began about two weeks after bursitis had healed. He was under the care of his family physician and a consulting urologist who advised conservative treatment after 10 days hospitalization, during which period urinalysis and x-ray examination were negative. He had returned to work but had occasional soreness over his left loin and lumbar spine but never had any fever or urinary symptoms. Our diagnosis was probable peri-renal infection following metastatic cortical kidney abscess.

In June, 1932, he developed a mass in the left loin, was febrile, and was promptly hospitalized. His temperature was 101 degrees, pulse 86, leucocytes 14,000, pyelograms were negative but there was some obliteration of the psoas outline; x-ray of the chest and spine was negative, functional tests of kidneys normal, and urinalysis was negative except for a very few leucocytes. The kidney

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was not palpable but there was deep tenderness over the left abdomen and a tender mass over the left loin. At operation a large quantity of purulent material was liberated, mixed with a peculiar substance of gelatinous consistency. The cavity extended from the ribs to the crest of the ilium; there was no demonstrable connection with the kidney, or spine. Cultures revealed Staphylococcus aureus; cultures for fungi were negative. Guinea pig inoculation proved negative subsequently. The pathological report was temporarily confusing in that a neurocytoma was diagnosed and confirmed by several able pathologists. Subsequent examinations, however, indicated an atypical granulation tissue. The cavity was loosely packed and subsequently treated by Dakin's irrigations.

The wound having healed, the patient left the hospital on July 13, and felt well until August 8, when he developed the same symptoms and findings in the opposite (right) loin so was again operated on, the findings, both laboratory and operative, being practically identical with those at the previous operation except that the opposite side was involved. This time, however, the pathologists concurred in recording the diagnosis of the microscopic sections as atypical granulation tissue. The wound was left wide open, loosely packed with vaseline gauze, and healed in about three weeks.

The patient felt well for about two months but was readmitted to the hospital on November 21, 1932, because of a recurrence in both loins. A bilateral operation was performed, and again no involvement of bone or connection with any organ was found. As before, all the ramifications of the abscess cavities were freely opened, left wide, and loosely packed. Convalescence was much slower this time, the patient leaving the hospital on April 11, 1933. He remained in good health and worked until July, 1934, when he had a recurrence in the left side. Operation showed a marked diminution in the size of the cavity as compared with previous operations and it healed within a few weeks. Pyelograms, kidney function tests, urinalysis, x-ray examination of spine and lungs, guinea pig inoculation, and cultures for fungi were negative. The patient has regained his normal weight, feels well, and has been working since September, 1934.

In any patient with symptoms referable to the loin or abdomen of obscure origin, with either an acute febrile or slowly developing course, one should consider the possibility of a cortical kidney abscess. Inquiry should be made as to a distant primary focus from two to six weeks previous, such as a furuncle, paronychia, or some recent disease such as influenza. The Staphylococcus is the usual invader.

The differential diagnosis between kidney carbuncle and peri-nephritic abscess may be quite difficult. In the latter, obliteration of the psoas outline, elevation of the diaphragm, a palpable mass or a fluid wave by fluoroscopy, if present, are helpful. In carbuncle (if at all extensive) functional kidney tests and a distorted pyelogram are valuable signs. Pathological urinary findings are notorious for their absence in both conditions but in carbuncle, urine from the catheterized ureter may show some pus cells and occasionally a positive culture.

This patient apparently had a very small cortical abscess from which extension occurred to the perirenal tissues, the original kidney lesion undergoing complete cure. The organism was, of course, of very low virulence.

We cannot be certain that this patient is cured because of the relative recency of his last operation but he is well clinically and no abnormality can be detected in his kidneys, both by functional test and x-ray.

Bilateral peri-renal abscesses are very unusual, as are bilateral renal carbuncles. The vast majority of these peri-renal infections arise from cortical kidney infection, though they may occur by extension from the spine, pleural cavity, abdominal organs, or even directly through the blood stream from some distant focus.

Ohio Forms

By EMERY R. HAYHURST, M.D.
Consultant in Industrial Hygiene,
Ohio Department of Health

READERS of *Industrial Medicine* may be interested in two forms concerning the reporting of occupational diseases in Ohio which have just undergone the regular annual revision. The first of these refers to "Pneumoconiosis Reports," and the second to "Supplementary Evidence in the Diagnosis of Lead Poisoning." Attached to the special lead poisoning form is the Certificate of Industrial or Occupational Diseases without which this form would not be complete.

In the case of pneumoconiosis reports, however, we have made the one-sheet-form (mimeograph) all that is required.

All occupational diseases occurring in Ohio have been required to be reported to the State Director of Health since May, 1913. The "Certificate of Industrial or Occupational Disease" is the standard form for such reports. A copy of the Ohio Reporting Act will be found on the reverse of the certificate (p. 117). Such reports are necessary whether or not the case is subject to compensation, for which a limited schedule of diseases has been fixed by law and the compensation for which is a separate and distinct matter under the jurisdiction of the Industrial Commission.

We have certain other report forms such as those referring to mishaps from motor exhaust poisoning (non-industrial) and carbon monoxide poisoning from domestic heating appliances, but these would not prove of much interest.

Pneumokoniosis Form

TO THE Doctor: 1. Enclosed find revised blanks for reporting cases of pneumoconiosis (of any form). These reports are necessary under Section 1243-1, General Code of Ohio (see reverse of the printed Certificate of Industrial or Occupational Disease, also enclosed).

2. The essential data wanted for every occupational disease, and that for pneumoconiosis alone, have been combined so that only the one mimeographed form is necessary for reporting pneumoconiosis.

3. Please use a separate form for reporting each case. Where a series of x-rays have been made under different techniques, the same should be so indicated, either on the one form or a separate form in order to bring out the distinctive "x-ray exposure factors" under Item 7.

4. Please discard previous forms which you may have on hand for reporting pneumoconiosis.

5. While pneumoconiosis (silicosis, etc.) are not yet on the compensation schedule for occupational diseases in Ohio, we are rapidly accumulating competent data, through this means, for transmission to the legislature as may be demanded at any time.

6. Until further notice, x-ray films in which pneumoconiosis is suspected or claimed, may be forwarded to this department for evaluation and report.

7. The present blank makes no reference to complicating diseases (such as alcoholism, syphilis, heart disease, etc.). Any significant complicating disease should, however, be mentioned, using some convenient space on the mimeographed form.

Lead Poisoning Form

TO THE Doctor: In order to approve reports of certain occupational diseases concerning the diagnosis of which controversy may arise, and often does arise, we are asking for additional facts. This particularly applies to lead poisoning.

We have accordingly compiled for lead poisoning the enclosed two-page questionnaire entitled "Supplementary Evidence in the Diagnosis of Lead Poisoning," asking the reporting physician to fill out the different items so far as he has evidence and to *return one copy of same to us* as a supplemental statement to be affixed to the or-

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REPORT ON PNEUMOCONIOSIS

Date of this report.....

1. Case of.....Address .....
2. Age .....Sex ..... Color .....S M W D .....Racial Stock.....
3. Physician (or hospital).....Address .....
4. Radiologist .....Address .....
5. Roentgenogram(s) Flat .....Stereo .....
6. Date Photographed.....Identification Marks.....
   Chest thickness (A.P.) .....
7. X-ray Exposure Factors Ma.....Kv. P.....Distance .....Time .....
   Films (make).....Screens.....Chemicals (make) .....
   Patient's position.....Cassette position.....
8. Employer .....
9. Nature of Business.....
10. Exact occupation(s) claimed to be associated with patient's affliction .....
    .....

11.	(a) Year Entered	(b) Year Left	Average (c) days per week	Average (d) hours per day
	1.	.....	.....	.....
	2.	.....	.....	.....
	3.	.....	.....	.....

12. Previous or other occupations	Year Entered	Year Left
.....	.....	.....
.....	.....	.....
.....	.....	.....

13. Initial complaints .....
14. Respiratory tract history (upper, lower).....
15. Chief Symptoms: Dyspnoea.....Cough.....Pain in chest.....Colds.....
    Expectoration .....Blood tinged.....Malaise .....Vomiting .....
    Cyanosis .....Clubbing of fingers .....Curved nails.....
    Weight, previous.....present.....Nutrition .....Hoarseness .....
    Respiration rate (at rest).....Chest expansion .....
    Vital capacity.....% of normal.....Actual hemoptysis.....
    Pulse rate (at rest).....after exercise..... Fever..... Night sweats..... Pleurisy.....
    Persistent rales .....Sputum findings .....
    History of known exposure to tbc.....(Sputum, animal inoculations.....)
    Luetic tests.....Date first symptoms appeared.....
    Date when first quit work because of present affliction.....
16. Present amount of disability.....

Signed.....

WRITE PLAINLY WITH INK—THIS IS A PERMANENT RECORD
N. B.—Every item of information should be carefully supplied. The exact statement of OCCUPATION is very important. Physicians should state DIAGNOSIS in plain terms. See instructions on back of certificate.

OHIO DEPARTMENT OF HEALTH

CERTIFICATE OF INDUSTRIAL OR OCCUPATIONAL DISEASE

NAME OF PATIENT .....

ADDRESS: Street and No. ..... **City or Village** .....

PERSONAL AND STATISTICAL PARTICULARS

Sex	Age	Color	Country of Birth

Single, married, widowed or divorced (write the word)

Occupation

(a) Trade, occupation or work (in which disease was acquired) .....

Particular kind of work in such trade, etc. .....

.....

Date of entering this occupation .....

Employer's name .....

Address .....

Employer's business (goods made or work done) .....

.....

(b) **Previous** occupations:

Name of occupations	Entered (year)	Left (year)

Previous illnesses, if any, due to occupation:

Disease or illness	Year

MEDICAL CERTIFICATE OF DISEASE

Diagnosis .....

Chief symptoms and conditions .....

.....

.....

Date first symptoms appeared .....

Complicating Diseases (such as alcoholism, syphilis, tuberculosis, etc.) .....

.....

What substance(s) or condition(s) in your opinion caused this affliction? .....

Duration (actual, estimated) .....
(Check which)

Additional facts .....

.....

.....

Date of diagnosis ....., 193.....

(Signed) ....., M.D.

....., 193..... (Address) .....

Ind. Hy. 3—15M—3-32 **Mail to STATE DIRECTOR OF HEALTH, Columbus.** For Instructions See Other Side

(REVERSE)

OHIO DEPARTMENT OF HEALTH
COLUMBUS
INSTRUCTIONS FOR FILLING OUT CERTIFICATE

Present Occupation. Precise statement of occupation is very important so that the relative healthfulness of various pursuits may be known. It is necessary to know both general trade or profession (for example, **printer**) and also the particular kind of work or banch of the trade (as **hand compositor** or **linotype operator**.)

Date of entering present occupation is important to determine how long the worker may have been exposed to the hazard before contracting the disease.

Employer's name, address and business are necessary to ascertain distribution of occupational diseases by industries, many trades (e.g., machinists) being common to different industries.

Previous Occupations need to be known, if possible, because present illness may be due to a former rather than present occupation. Give simply the name of each distinct occupation which the patient may have followed, with the year he entered and the year he left.

Previous Illnesses. This refers either to previous attacks of present disease, or to any other disease, **due to occupation.** All that is required is the name of each such disease or illness with the year in which it occurred.

Medical Certificate. Only two of the items specified for this require any explanation. In making these reports it is necessary to consider the possible influence of factors other than occupation as causes of the disease. For this reason any **complicating diseases** should be noted, such, for example, as alcoholism or syphilis in connection with arteriosclerosis in cases of lead or other metal poisoning. The possible effect of other factors, such as poor hygienic conditions in the home, or other personal conditions, must be considered, and when discoverable should be noted under **additional facts.**

AN ACT—To Require the Reporting of Occupational Diseases—(As amended February 4, 1920)

Be it enacted by the General Assembly of the State of Ohio:

Report of occupational diseases by physicians

Section 1243-1. Every physician in this state attending on or called in to visit a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, wood alcohol, mercury or their compounds, or from anthrax or from compressed air illness and such other occupational diseases and ailments as the state department of health shall require to be reported, shall within forty-eight hours from the time of first attending such patient send to the state commissioner of health a report stating:

When and to whom to be made

(a) Name, address and occupation of patient. (b) Name, address and business of employer.
(c) Nature of disease. (d) Such other information as may be reasonably required by the state department of health.

The reports herein required shall be made on, or in conformity with, the standard schedule blanks hereinafter provided for. The mailing of the report, within the time required, in a stamped envelope addressed to the office of the state commissioner of health, shall be a compliance with this section.

Blanks for report

Section 1243-2. The state department of health shall prepare and furnish, free of cost, to the physicians included in the preceding section, standard schedule blanks for the reports required under this act. The form and contents of such blanks shall be determined by the state department of health.

Such Reports not evidence

Section 1243-3. Reports made under this act shall not be evidence of the facts therein stated in any action arising out of the disease therein reported.

Section 1243-4. It shall furthermore be the duty of the state department of health to transmit a copy of all such reports of occupational disease to the proper official having charge of factory inspection.

Copy of report to be transmitted to proper official

Penalty

Section 1243-5. Whoever being a physician practicing in the state of Ohio, neglects or refuses to make and transmit to the state commissioner of health any report provided for in section 1243-1 of the General Code shall be fined not to exceed one hundred dollars or imprisoned for not to exceed ninety days, or both, but no person shall be imprisoned under this section for a first offense and the prosecution shall always be as and for a first offense unless the affidavit upon which the prosecution is instituted contains the allegation that the offense is a second or repeated offense.

NOTE—In addition to the diseases or disabilities provided for in Section 1243-1 of the above law, the regulations passed by the Public Health Council on February 27, 1920, provide in Regulation 2 for the reporting of "any disease or disability contracted as a result of the nature of the person's employment, including the following diseases or disabilities and not excluding others:

Anilin poisoning	Bisulphide of carbon poisoning	Naphtha poisoning
Benzine (gasoline) poisoning	Carbon monoxide poisoning	Natural gas poisoning
Benzol poisoning	Dinitrobenzene poisoning	Turpentine poisoning

NOTE—A schedule of occupational disease compensable in Ohio will be sent upon request to the State Director of Health, Columbus, Ohio.

iginal report. While this information will be made available to the Ohio Industrial Commission, all matters concerning compensation should be taken up with the Commission directly.

The following named patient (s) has (have) been reported to this office by you for which this information is desired:

Date Report Received **Name** **Address** **City**

.....

.....

Additional questionnaire blanks are available upon request.

OHIO DEPARTMENT OF HEALTH
Division of Hygiene
Bureau of Occupational Diseases
Columbus, Ohio
Supplementary Evidence in the Diagnosis of Lead Poisoning

Patient's Name.....Address.....
Physician's Name.....Address.....
Has this patient had previous attacks of lead poisoning?
.....Give approximate date(s).....
What were the **onset symptoms** in the present attack?.....
.....
Was disability such that work was stopped?.....
If so, when?.....

Check or Comment on the Following Items

I. Objective Findings (i.e., the physician's observations)
Pallor (especially circumoral).....
Blue line in gum(s)*.....
Stippling* (basophilia of red cells).....
Polychromatophilia .....
Reticulocytosis* .....Mononucleosis .....
R. B. C. count(s).....W. B. C. count(s).....
Hemoglobin %.....Recent retrograde blood changes?.....
Blood pressure findings.....Pulse (at rest).....
Teeth, gums (condition of).....
Hand-gripping power (condition of): R.....L.....
Wrist extensors (any actual wrist drop?): R.....L.....
Tremor .....Incoordination .....Ataxia .....
Reflexes: Patellar.....Ocular .....
Vision: R.....L.....Recent disturbances.....
Hearing: R.....L.....Recent disturbances.....
Mental disturbances .....
Malnutrition.....Emaciation .....Premature ageing.....
Gouty signs.....Evidence of nephritis.....
Skin (acne, etc.).....Weight variations.....
Other objective findings of note.....

*"Blue line in gum(s)", "stippling" and "reticulocytosis" occur in **Lead Absorption,** but, with or without these, it requires significant abnormalities in various ones of the other **Objective** and **Subjective** findings listed to sustain a diagnosis of actual **Lead Poisoning.**

II. Subjective Findings (i.e., the patient's complaints)
Morning anorexia.....Metallic (or sweet) taste.....
Nausea or vomiting.....Distress in abdomen.....
Obstinate constipation.....Abdominal colic attacks.....
Headache .....Insomnia .....
Weakness (hand grips; use of wrists, legs, feet, etc.).....
General weakness.....Syncopal attacks.....
Rheumatic pains.....Muscle cramps.....
Disturbed vision: R.....L.....Dizziness.....
Deafness: R .....L. .....
Weight: Normal.....At present.....
Mental depression.....
Any further comment:.....
Physician's Signature.....
Date.....

The diagnosis of Lead Poisoning involves evidence of (1) **exposure** to lead or its compounds; (2) **objective** signs of blood changes, of nervous involvements and usually nutritional disturbances; and (3) the presence of a number of the **subjective** phenomena above listed. To be occupational, industrial exposure must be established.

Stippling (also reticulocytosis and polychromatophilia) indicate that lead absorption is going on at the time. The number of stippled cells found increases as absorption progresses and is a rough measure of the amount of exposure. Hence workers showing stippling without other evidences should have blood examinations made frequently. Stippling with other evidences (see above list of objective and subjective findings) constitutes acute lead poisoning, but acute lead poisoning occasionally exists without stippling (here **reticulocytosis** is invariably prominent and the red cells should always be examined for this condition). When the condition becomes chronic stippling usually diminishes, but is rarely absent as long as exposure continues or other clinical signs prevail, while anemia is invariably present, usually also with polychromatophilia.

Reports of analytical findings of lead in the blood, urine and feces are of doubtful value since accuracy of testing methods, metabolic disturbing factors at the times of tests (which must be made over days and preferably weeks), and ultimate significance of tests in view of the findings of "normal" lead in perhaps equivalent amounts, all confuse the picture.

Medical Departments

ONE of the most comprehensive industrial medical services in the U. S. at the present time with direct charge against the treasury of the company is that provided at the Endicott-Johnson Shoe Company, Binghamton, N.Y. This organization in 1928 provided free medical care for 15,000 employees and their families. There are no restrictions on the kind or amount of medical care which an individual may receive.

"A more recent development in group payment for medical care is the service to the students of the leading universities and colleges in the United States. Usually the student pays a fixed amount for medical services, which is included in tuition fees. The amount of service and the annual fees vary with the particular institution.

"Some of the different types are:

"In Dallas, the Employees Mutual Benefit Association of the street railway company has arranged a monthly payroll deduction to provide money benefits and medical care by physicians during periods of sickness, or disability other than that covered by the Workmen's Compensation Laws. There are about 800 members who pay $.85 per person per month for professional services by the physicians of a well-known clinic in the city of Dallas. In addition to this contribution the company makes a payment of $100 per month, with the result that approximately 98% of the employees of the street railway company are members of the association, the other 2% being transient workers or those who for special reasons are not eligible.

"A unique arrangement for medical care has been established in Baton Rouge, La. The employees of the local Standard Oil Company refinery some years ago organized the Stanocola Employees Medical and Hospital Association for the purpose of providing medical care for themselves and their families. Various arrangements were tried, and in 1928 the association established its own clinic with seven full-time practitioners to render complete medical care to the 2,700 members and their families. A monthly deduction of $3 per certificate holder guarantees complete medical care for the employee and his family. A maximum of $250 is allowed for any particular case for hospitalization and for special nursing. Maternity cases are not hospitalized at the expense of the association except when it is considered medically necessary by the attending physician. Membership is voluntary, and about 75% of the white employees are members of the association. The association owns a clinic building as well as complete medical and surgical apparatus." — Dr. Theodore Morford, in *The Journal of the Tennessee State Medical Association.*

Tularemia

—*A Discussion of Francis' Disease, With Case Histories*—

by

GEO G. DAVIS, M.D., HENRY A. HANELIN, M.D., AND THEODORE C. MOUZAKEOTIS, M.D.*

From the Cook County Hospital Surgical Service of Dr. Geo. G. Davis, Associate Clinical Professor of Surgery, Rush Medical College, University of Chicago.

TULAREMIA is a specific infectious disease caused by Bacterium tularense and transmitted from rodents, especially wild rabbits, through the bite of an infected tick or blood sucking fly, or by contamination of the abrasion on the hands or conjunctiva in handling infected rodents, as in the case of market men, laboratory workers and lay people who hunt and dress the rodent infected with the disease. In animals, the disease occurs as a fatal bacteriemia resembling plague.[1]

CAUSATIVE ORGANISM: The exciting organism, the B. tularense, is a small, non-motile, gram-negative cocco-bacillus, growing best on coagulated egg yolk or glucose blood agar containing cystin or bits of sterile spleen.

INCIDENCE: In animals, the disease occurs as a bacteriemia among wild rabbits, ground squirrels, wild rats and mice. In man, cases have been reported from nearly all over the United States and also from Japan.

TRANSMISSION FROM ANIMAL TO ANIMAL[2]: This may occur by means of the rabbit louse (Haemodipsus ventricosus) or by the rabbit tick (Dermacentor andersoni). In the laboratory, transmission has been accomplished from one white mouse to another by the mouse louse and common bedbug; from one guinea pig to another, by the biting stable fly and by the stable flea.

TRANSMISSION FROM ANIMAL TO MAN: (a)—This may occur by the bite of the deer fly (Chrysops discalus). This species of fly is found chiefly in Utah and the adjoining states. It is a blood sucker of cattle, rabbits and man. (b)—It may be transmitted by the bite of the wood tick (Dermacentor andersoni), found chiefly in Montana. This tick harbors the Bacterium tularense in its body and transmits it to its offspring. (c)—Transmission may be by bites of other ticks, not yet definitely classified; such ticks are found in Arkansas, Oklahoma, Tennessee, Texas and Louisiana. (d)—Also hands may be infected from handling infected rodents or from flies and ticks when removing them from cattle. The conjunctiva may thus be infected by rubbing the eye. (e)—The transmission may be effected by the bites of animals (coyote, ground squirrel, hog, etc.) the mouths of which are contaminated from eating infected material (f)—or transmission may be from laboratory infection, usually seen in laboratory workers culturing the organisms, or performing autopsies on animals or people who have died of the disease.

SUSCEPTIBILITY: (a)—Man is very susceptible while the monkey, ground squirrel, rabbit, guinea pig, mouse, woodchuck, oppossum, coyote, pocket-gopher, porcupine, chipmunk, muskrat, water-rat of Europe, quail, grouse and Hungarian partridge, are susceptible in the order of their mentioned sequence. (b)—The susceptibility is slight in rats, cats, sheep and goats, (c) and is absent in horses, cattle, dogs, pigeons, foxes, chickens, turkeys and hogs.

PATHOLOGY: The clinical types are the glandular, ulcero-glandular, oculo-glandular and a typhoid form.

The organism is not found in smears or tissues from man, but is usually isolated by inoculation of guinea pigs[3]. The gross lesions are diagnostic in inoculated rabbits and guinea pigs. The lesions are microscopic in white mice, in which the cord cells and Kupffer cells of the liver contain large numbers of the organism. The disease in man shows acute and sub-acute forms dependent largely upon the host's resistance. The ulcero-glandular form shows a primary lesion in the skin, at first papular, and then ulcerating. The oculo-glandular form shows a primary conjunctivitis. Both show pronounced and prolonged enlargement of the regional lymph nodes. A glandular form occurs without a primary lesion, and a typhoid form occurs without either a primary lesion or lymph node involvement. Microscopically, the acute lesions are in the form of focal areas of necrosis, usually with a more or less marked infiltration of polymorphonuclear and large mononuclear cells. Langhans giant cells soon appear and proliferation of the lining cells of blood vessels may occlude the lumina. Surrounding fibrosis progresses and may ultimately cicatrize the area completely. These phenomena described by Francis and Callender and by Francis are observed in the usual ulcero-glandular form. The primary skin lesion has been described by Netherton and by Goodpasture and House and the acute visceral lesions by Simpson. The conjunctivitis usually heals without after effects. The typhoid form shows no demonstrable lesions. In fatal cases focal areas of necrosis a few millimeters in diameters are often found in the spleen, liver and lungs. In the lung lesions, there is a focal pneumonia, the alveoli being filled principally with large mononuclear cells, other cells and a little fibrin. Necrosis and vacuolization of the mononuclears produce an appearance resembling caseous pneumonia but with little or no damage to the alveolar walls. Fulmer and Kilbury mention that a slowly progressing peritonitis may occur with profuse fluid exudate containing the organism and the formation of small white nodules on the peritoneal surface.

SYMPTOMS: The period of incubation[1] may be as short as one day or as long as 10 days. It is usually three or four days. The onset is sudden and characterized by chills, headache, muscular pains, vomiting, prostration and fever. The temperature rises rapidly to 102-104° (F.) and continues high for two or three days, when there is a remission lasting from one to three days. Following the remission the temperature rises again to its orig-

* Read before the Central States Society of Industrial Medicine and Surgery, at Cook County Hospital, February 26, 1935.

inal height and then gradually declines to normal, the whole febrile period lasting from two to three weeks. The general symptoms subside during the remission but return with the secondary rise of temperature. Moderate leukocytosis is usually ob-

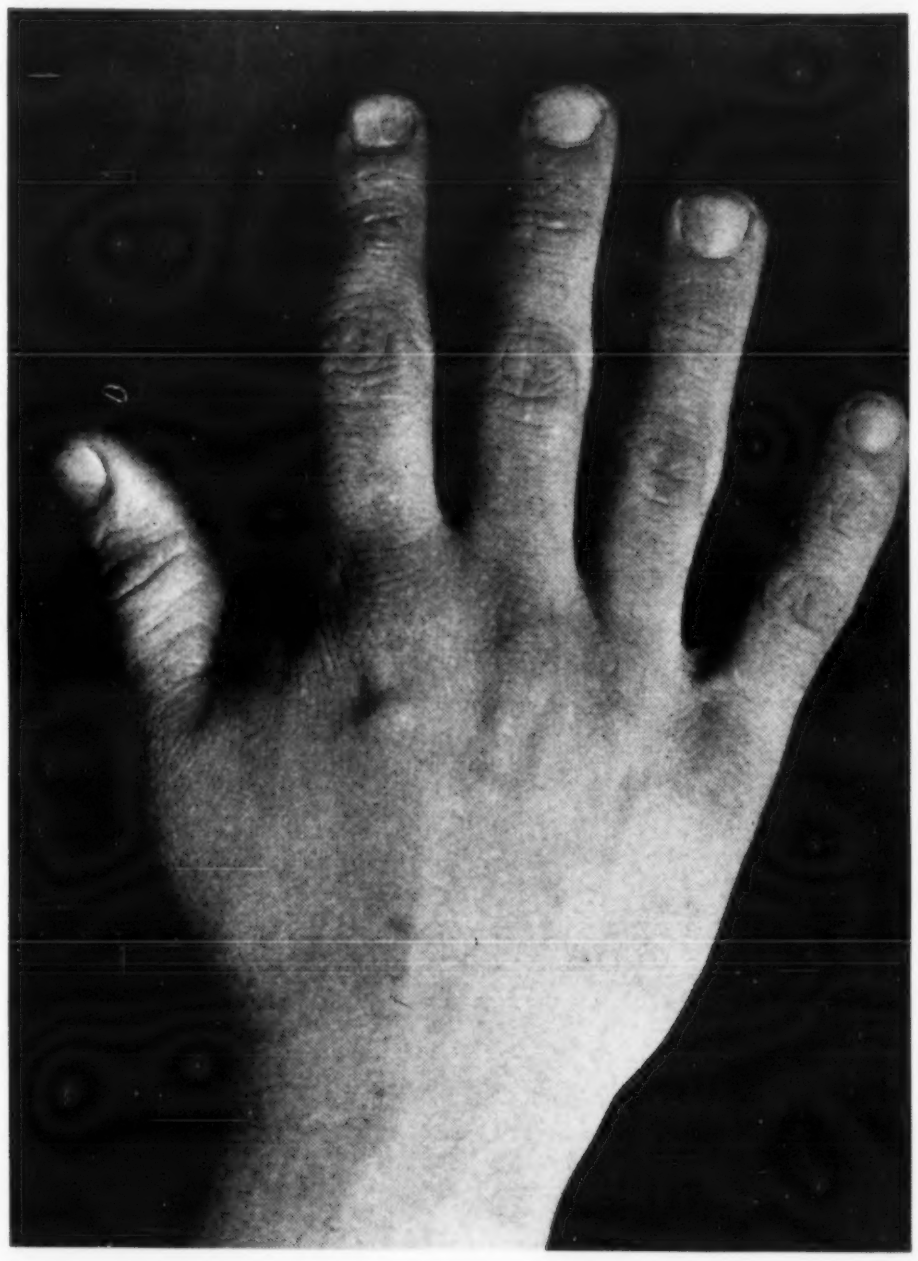

Fig. 1 (Case No. 1): Showing atrium of tularemia infection on dorsal surface, distal phalanx, right index finger.

served. An eruption, most frequently macular or papular, but occasionally pustular, sometimes appears upon the skin. In the most common type of the disease, the ulcero-glandular type, the lymph nodes draining the infected area become swollen and tender within 48 hours after the onset. Suppuration may occur or the affected nodes may remain palpable, hard and sensitive for many weeks. About 24 hours after the adenopathies appear the site of inoculation becomes manifest by the occurrence of a painful papule which rapidly breaks down leaving a small punched-out ulcer. Occasionally, small subcutaneous nodules appear on the forearms and arms, and ultimately, these, too, may suppurate. In a small proportion of cases, acquired in dressing rabbits for market, the enlargement of the regional lymph nodes is unaccompanied by any primary lesion (glandular type). In some cases, the primary localization is in the conjunctival sac (oculo-glandular type) and the constitutional reaction is accompanied by inflammation of the conjunctiva, swelling of the lids, painful enlargement of the parotid, sub-maxillary and cervical glands, and usually a small papule forms on the inner surface of the lower lid.

In a day or two, discrete ulcers form on the conjunctiva.

In another relatively small group of cases, chiefly in laboratory workers, the primary lesion and glandular enlargements are wanting, and the chief symptom is a continued fever lasting two or three weeks (typhoid type).

Convalescence from tularemia is slow, and frequently many months may elapse before the patients' health is completely restored. Complications are not common but broncho-pneumonia, meningitis, and peritonitis may occur. Recrudescences of fever are sometimes observed. Suppuration of the lymph nodes may occur many months after the onset of the disease.

DIAGNOSIS: The direct diagnosis is suggested by a history of handling carcasses of wild rabbits, or

Fig. 2 (Case No. 2): Showing the papulo ulcerated lesion at the base of the left index finger and concomitant involvement of the dorsal surface of the forearm.

of being bitten by a tick or fly followed by a primary papular lesion, resulting in a persistent ulcer or a primary conjunctivitis, followed by ulcers on the conjunctiva and by persistent adenopathies in the region of the primary lesion and fever of two or three weeks duration. The diagnosis is corroborated by the agglutination of B. tularense, using patient's blood serum which is effective in the second week although the agglutination titer is higher in the third week; by the Foshay[4] intra-dermal reaction and by isolation of the specific bacterium from guinea pigs that have been inoculated with material taken from the primary lesion, from large lymph nodes, or from the blood of the patient.

DIFFERENTIAL DIAGNOSIS: Typhoid fever, septic infection, anthrax, and tuberculosis are diseases most likely to be confused with the typhoid form of tularemia, therefore a careful history with a subsequent serological and x-ray examination of the chest are very important. The ulcero-glandular form must be differentiated from sporotrichosis, blastomycosis, secondary and tertiary lues,

and actinomycosis. The oculo-glandular form must be carefully differentiated from all ulcerating lesions of the conjunctival sac and cornea, associated with regional adenopathy.

Prognosis: The outlook, as a rule, is favorable, the mortality in 679 reported cases analyzed by Francis[5] was 3.54%. Fulminating cases rapidly ending in death are sometimes noted in the oculo-glandular type.

Case Reports: Case No. 1: A twenty-two year old Swedish male, was admitted to our service from the receiving ward with a diagnosis of a right axillary abscess. The past history revealed that on December 10, 1934, he had purchased from a meat market, 10 rabbits which had not been dressed. His mother, two brothers and he skinned and prepared the animals. The patient does not remember whether he had an abrasion on his hand

Fig. 3 (Case No. 2): Showing the involvement of the right hand with papulo squamous lesions of the palmar aspect of the left hand.

or whether he had scratched himself at the time of skinning the rabbits. Seven days later he noticed on the dorsal aspect of his right index finger (Fig. 1) a papular lesion which subsequently became pustular. Preceding the lesion on the finger he had noticed that on the previous day his right arm and forearm were unusually awkward in handling because of "lumps" as he called them that appeared along the extensor surface of the forearm and arm. He did not pay any attention to the initial lesion, thinking that he had only a felon of the finger, and his diagnosis was more or less substantiated by a physician who advised hot packs, with the object of localizing the lesion. Under this management, the local lesion healed leaving a small punched-out area with a subsequent cicatrix formation. The subcutaneous nodules diminished in size, and later a large lump was felt in the right axilla, which was tender to touch and hard in consistency. He states that on December 20, 1934, he had a touch of the "flu" which caused him to stay in bed for three days, but did not materially inconvenience or distress him. The axillary lesion began to grow larger until it reached the size of a hen's egg and became troublesome as it interfered with his arm movements. He was admitted to the ward six weeks after the onset of his condition. Physical examination revealed a well developed white male, ambulatory and not acutely ill, with temperature 98.6, pulse 80, respiration 20, blood pressure 120/80. The general physical examination was negative except for a very slight scar on the dorsum of his right index finger and small, discrete nodules on the dorsum of his right forearm in line with the lymphatic drainage of the finger, but these were not painful to touch. There was an abscess in the right axilla, purplish gray in color, fluctulant, slightly tender and about the size of a small hen's egg. It was thought best not to incise the abscess but to allow it to break down by itself,

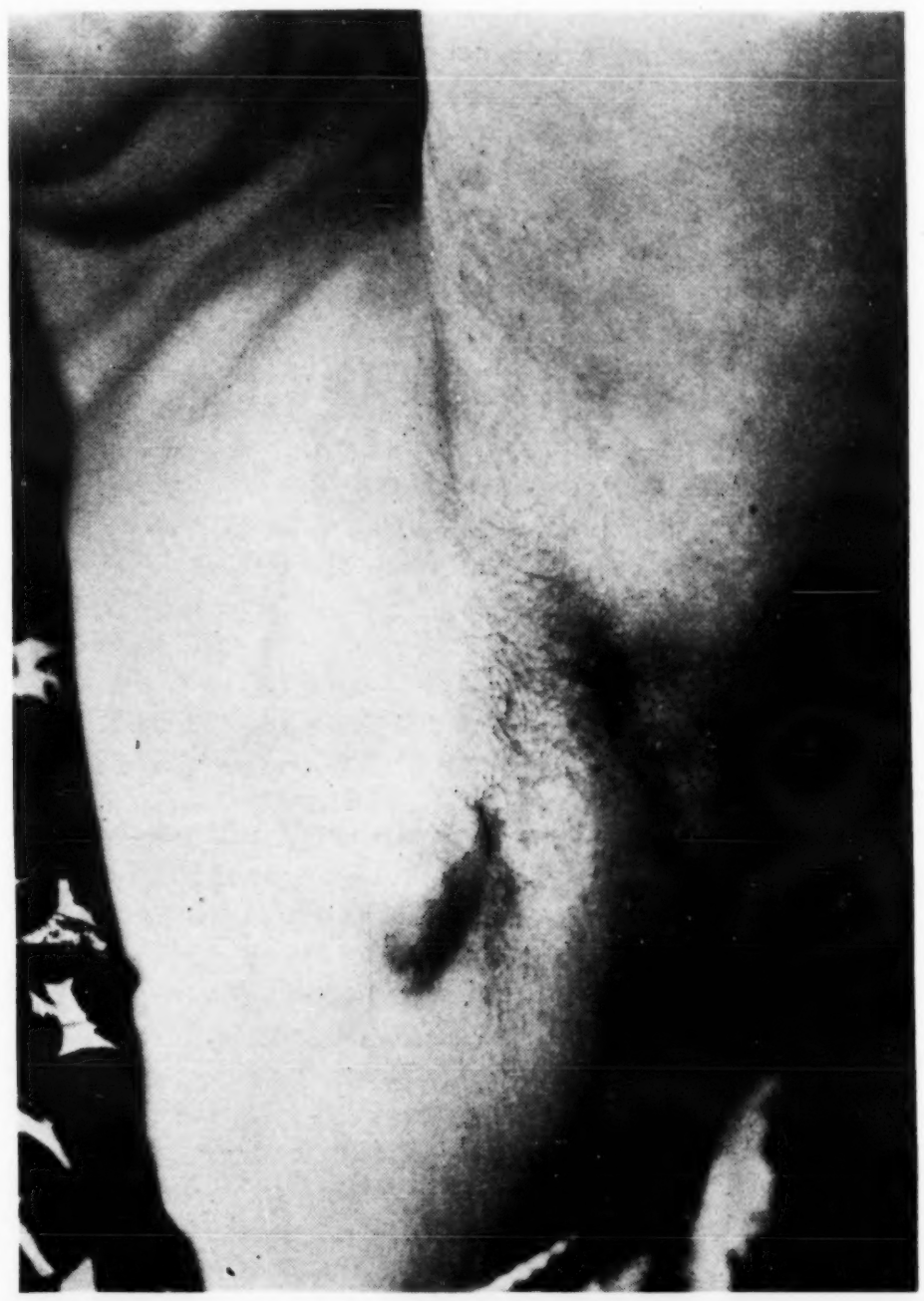

Fig. 4 (Case No. 2): Showing regional lymph gland adenopathy and axillary abscess formation.

which it eventually did, discharging a thick whitish-gray exudate with only a fair amount of blood.

Laboratory tests: The blood count showed the red cells to be four million; white cells, twelve thousand; polys, 87%, monos, 10%. The urine was negative; Wassermann, negative; the agglutina-

tion was positive for B. tularense in a dilution of 1-640.

The patient returned home two weeks after his admittance to the hospital or eight weeks after the onset of his condition, in perfect health and with a draining sinus in the axilla.

CASE No. 2: The mother of Case No. 1, who had helped to clean the rabbits, noticed that about 10 days later she developed a sore spot on the middle finger of her left hand and subsequently noticed a discrete nodular formation on her left forearm and arm, extending from her infected finger to the axilla. Three or four days after the onset she noticed that the nodules became very tender, reddened, and in some places pustular and that her index finger began to show similar findings as on her middle finger and forearm. Concurrently she had a profound constitutional disturbance consisting of malaise, fever, nausea, vomiting, prostration and lassitude for five weeks. She was seen by a physician who told her she had the "flu," advised bed-rest, and prescribed hot fomentations locally for her arm lesions. However, she appeared to recover from her general symptoms, but her skin eruption persisted. It so happened that she came to visit her son in the male ward, and in view of the family history, she consented to a physical examination.

Physical examination revealed a well developed white female, 56 years of age, not acutely ill. The essential pathology consisted of discrete ulcerating papulo-lesions of the left forearm and arm and right hand (Figs. 2 and 3) extending along the dorsal and flexor surfaces. The axillary nodes were involved and there was an axillary abscess (Fig. 4) as in her son's case.

Laboratory findings: Red count, three million two hundred thousand. White count, nineteen thousand; polys, 80%; monos, 17%; Wassermann, negative; positive agglutination for B. tularense in a dilution of 1-720.

The patient was hospitalized and the Foshay treatment advised. The subsequent course will be detailed in a further report of the case.

TREATMENT: Prophylaxis should be advocated at all times. Thorough cooking of a rabbit destroys the organisms. Great care should be taken in the laboratory during autopsies on infected animals; in experimental contact with the organisms rubber gloves should be worn. Hunters, cooks, storekeepers and housewives should wear rubber gloves while skinning and dressing rabbits, and this preferably should be performed by immune individuals.

ACTIVE TREATMENT: Foshay[6] has prepared a specific serum from the goat which is effective in treating tularemia in man. As a result, the duration of adenopathy[7] and the period of disability have been significantly and appreciably shortened. Recommendations for dosage in patients with infections of average severity consist of two intravenous injections of 15 cc. each on successive days, of the goat antiserum made from virulent strains of the organism. When the lymph nodes are larger than 5 cm. in diameter three doses may be used. In the typhoid form the antiserum may be used in larger amounts. The general regime is that of an acute infection. Symptomatic treatment is of great importance—rest in bed, and the ingestion of easily digestible food of a high caloric value are indicated. High fever should be treated by hydrotherapy, abundant water administered and the bowels should be kept open. Stimulants are required. Excision or incision of enlarged glands should not be performed until a pronounced soft, thin area is demonstrable in the skin over the gland.

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Lead in Cerebrospinal Fluid

LEAD poisoning is no novelty in medicine*; its effects in producing pathologic changes in the body have been known almost as long as it has been employed in industry and the arts. Lead "colic" and lead "palsy" have long been recognized in medical literature. Credit for first correlating the most obvious manifestations of intoxication by lead is usually given to Tanquerel des Planches, who studied the subject about a century ago. Although lead has been regarded by many writers as the most important of the industrial hazards that lead to special disease, the incidence of industrial lead poisoning is said to be declining, thanks to the widespread introduction of prophylactic measures. According to Aub, about 150 industries involve some exposure to lead. The dusty trades are the most hazardous and include the manufacture of white and red lead, of storage batteries and of pottery, as well as painting, printing and the mixing of rubber.

Two features, of late, have become involved in the problem of plumbism. One is the method of treatment, initiated by Aub and Minot, that depends on the parallel metabolism of lead and calcium. The severe symptoms can be relieved by administration of large doses of calcium in the form of milk and salts of calcium, whereby a deposition of lead in the bones is effected. After disappearance of the acute symptoms, this regimen is replaced with one containing as little calcium as possible. With this a condition of acidosis is initiated, large doses of phosphoric acid or ammonium chloride being given to produce a negative calcium balance, thus tending to liberate lead slowly from the bones so that it will be excreted.

The other feature is the growing recognition that lead is widely distributed in nature, so that plants grown on soils that contain the element may acquire lead. Thus it finds its way insidiously into the body in food. The U. S. Department of Agriculture has found it desirable to attempt to establish a maximum permissible content of lead in edible products. It has been remarked that in view of this almost ubiquitous occurrence of lead one would expect it to be a common constituent of human excreta, owing to the ingestion of food materials containing lead; this is found to be the case. The average amount of lead in the feces of normal individuals with no

* Editorial in *J.A.M.A.*, May 5, 1934.

undue exposure to lead was found to be approximately 0.08 mg. per gram of ash. Its presence in feces does not, however, imply that it is present also in the body tissues; ingested lead may not be absorbed. According to investigators at the Montreal General Hospital, 10 years' experience in examination of the urine indicates that the presence of lead is the rule and not the exception. The average amount is 0.1 mg. per liter. Contamination during collection of samples is excluded. These observations fit in with those recorded by Kehoe and Thamann. Urine of individuals suffering from lead poisoning, or of those unduly exposed to lead in their work, may contain much larger quantities than 0.1 mg. per liter. The differences between health and disease are therefore quantitative and not qualitative.

The development of spectrographic methods has greatly facilitated the investigation of minute traces of lead. In studies at Montreal, lead was found in the cerebrospinal fluid of every individual known to be suffering from lead poisoning. Lead was found also in isolated cases not presenting histories of undue exposure to the metal. In these cases, with one exception, the amounts were, however, small compared with those found in lead poisoning. An attempt was made to induce the appearance of lead in the cerebrospinal fluid by means of acidosis. Acidosis was produced by the administration of ammonium chloride, and the degree of acidosis was determined by the carbon dioxide combining power of the plasma. Whether lead was or was not liberated from the body was determined by the amount of lead in the urine during acidosis compared with that found before acidosis. Of 20 individuals suffering from a variety of neurologic conditions other than lead poisoning, and in whom no lead was found in the cerebrospinal fluid before acidosis, lead was found in the cerebrospinal fluid in five cases during acidosis. As before acidosis, however, the amounts found were small. Rabinowitch and his co-workers again emphasize the fact that lead readily attacks the central nervous system. Cerebrospinal fluid has been found to contain as much as 1 mg. per liter, or 10 times that found in the urine of normal individuals. Its distribution in the body may be widespread. This accounts for the fact that lead poisoning may simulate almost every other disease of the central nervous system. Whether the minute quantities often present have any bearing whatever on obscure nervous symptoms is an important question for future consideration.

Industrial Hygiene Problems

ONE of the most far-reaching and important studies made by the Public Health Service* has recently been published. This was a survey of 615 establishments in a typical industrial area, involving 28,686 employees and undertaken for the purpose of determining the necessity of an industrial hygiene program—and if such a need was present, to learn just where and to what extent the problems existed.

The groups included metal products, printing, chemicals, clay — glass — stone, leather products, dyeing and cleaning, electroplating, storage battery manufacturing, rubber goods, and fur preparations.

Interesting concerning distribution of workers in these industries is that 48.7% of the plants had less than 10 employees and 10.2% had 100 or more persons. This distribution compares well with the industrial plants in the U. S. as a whole.

With regard to industrial welfare provisions, about 20% of the workers were provided with the services of a part or full time safety director; 17% of workers were under part time medical supervision, and 15.3% had the services of a full time physician; nursing services on a full time basis were present for 34.1% of employees.

The keeping of disability statistics afforded an interesting result: accident records composed the majority of such information because of the compulsory provisions of the state compensation act. Sickness records were kept on approximately 40% of the population studied, but most of these records existed in groups where there was a sick benefit association.

It is significant that the so-called "small plant" was found lacking in welfare provisions which have been found to play such an important part in a constructive program of industrial hygiene.

Potential accident hazards data showed 41% exposed to unguarded moving machinery, 13.2% to floor hazards and 7.5% without protection against the possibility of eye injuries from flying particles. Of further interest is the similarity of these potential accident hazards with compensated cases from the same type of causes in New York State for 1931.

Concerning the exposure of employees in various occupations to different materials and conditions, data presented for 10 groups of industries studied showed 50 materials and conditions existing in 615 plants, 39 of which were considered to be potentially hazardous from the viewpoint of possible systemic poisoning. The study brought out the fact that inorganic dusts, carbon monoxide and lead compounds still remain the most important materials of hygienic significance presenting problems to the industrial hygienist.

Such a study as this serves to emphasize the importance of a constructive program of industrial hygiene in which the physician and engineer are associated. The physician should be thoroughly trained in public health procedures and have a comprehensive knowledge of the effects upon health of various materials and processes in industry—in other words, he should appreciate and know the fundamental principles of industrial hygiene. The engineer should also have industrial hygiene training and be familiar with industrial processes. In conjunction with the work of these two persons, there should be a fully equipped laboratory for industrial hygiene studies.

Another relevant point which is well to emphasize here is the fact that the prevention and control of occupational diseases is probably the most important phase of future work concerning industrial hygiene problems. The real issue in the consideration of these problems is that occupational diseases are in a large measure preventable and further, that any industrial community can be well assured that the degree of prevention exercised through the use of personnel, special equipment and studies as indicated will be reflected in its general health status.

* The Potential Problems of Industrial Hygiene in a Typical Industrial Area in the United States. Pub. Health Bul. No. 216. U. S. Treasury Dept., Pub. Health Service, Washington, D.C., December, 1934.

Medicolegal Hazards

—The Doctor's Relation to Judicial Affairs—

by

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TWENTY-FIVE years or so ago the number of medical men who were recognized by their local bar and the courts as competent to serve as medical witnesses was relatively small. In those days physicians were supposed to be experts in all branches of medicine and most of them could meet this qualification, as there were no outright specialists at that time except in surgery and eye, ear, nose and throat.

As I glance back retrospectively and attempt to appraise the true worth of those loyal, rugged pioneers—now gone to their reward—the breadth of learning and vision that characterized them, their alertness in keeping abreast of medical progress, and their fearless and forceful personalities stand out most vividly. For some unaccountable reason I was thrown in contact with this group both here and elsewhere, but it was not altogether of my own choosing. Nevertheless it proved to be most interesting professional experience for which I long have been profoundly grateful. On the witness stand they were invariably courteous, judicial, immovable when right, and ready to combat any attorney no matter how skillful he was in the art of cross examination. Never did they find it necessary to consult an authority before rendering an opinion, as was and still is the custom of members of the legal profession. Appearing in court as a witness under oath was to them a solemn responsibility, and they never failed properly to equip themselves before testifying.

The medical witness of those evolutionary days was also assumed to be exceptionally resourceful. Not only did he properly care for his private practice but he also was called upon to assist the prosecutor when insanity became a defense in criminal trials, to cooperate with Common Pleas judges when the testamentary capacity of individuals involved in wills, contracts and habeas corpus proceedings was an issue, and to examine cases of so-called "railroad spine" and kindred disabilities in the court room (traumatic neurosis was unknown then). All of this of course is now past history.

Finally our cities began to emerge from a state of village mindedness and as they continued on their march to greatness, railroad transportation increased, industry prospered and expanded, and at last the automobile came on the scene. Naturally the number of personal injury claims multiplied tenfold or more, and the legislatures in their desire to safeguard the employee, pedestrian and passenger, passed laws which actually made it easier for alleged claimants to seek and frequently secure compensation. Here the crafty ambulance chaser so-called found a fruitful field of operation and he worked it to the fullest extent. Corporations were, therefore, practically forced to protect themselves, and many important manufacturing plants and kindred organizations found it expedient and necessary to develop medical or welfare departments which had for their purpose the elimination of industrial hazards, periodic examination of employees, prompt surgical treatment of the injured, competent follow-up care, and finally the warding off, when possible, of costly litigation.

This noble experiment did not at the onset have smooth sailing. There was as many of you will recall, considerable fiery opposition on the part of many practitioners who honestly believed that the plant doctor would eventually kidnap their clientele. But these apprehensions were in a large measure not well founded, as today we find the industrial surgeon firmly entrenched in a constructive undertaking which already has brought credit to himself, to industry and to the profession.

DURING the past decade considerable unkindly criticism has been openly and publicly directed against medical witnesses as a class, but it is refreshing to know that the judiciary is now willing to concede that a marked improvement is now in evidence. And yet there remain a certain few who seemingly cannot get down to earth, as it were, and assume a natural and impartial attitude in the court room. Consciously or unconsciously they crave a desire to stress their real or unreal professional accomplishments and, in their zeal, over-estimate the significance of subjective manifestations. But they do not deceive jurists of experience, most of whom have acquired more than a working knowledge of what is what in scientific medicine. Perhaps the profession itself is largely to blame for many of these shortcomings. In any event the average medical curriculum provides little if any practical instruction in medicolegal problems, and the young physician even today takes his departure from college or hospital with no intelligent conception of what is expected of him on the witness stand. He, therefore, is very likely, if not equipped with a substantial degree of common sense, to be misled or misguided by unfortunate contacts.

Physicians testifying in damage cases should realize at the onset that their opinion constitutes simply a link in the long chain of evidence, and not infrequently their entire testimony is wholly disregarded. In reality a certain psychology permeates the courtroom, and it is this factor, more than anything else, that controls the outcome.

When the trial starts, the attorney for the plaintiff pictures his client as a pitable, hopeless wreck, maimed beyond repair—by the negligence of a certain wealthy and powerful corporation. He flatters the jury because of their outstanding intelligence, and is sure that in their hands the unfortunate will be adequately compensated, not only for the suffering he has endured, but also for

* Presented before American Association of Industrial Physicians and Surgeons, Nineteenth Annual Meeting, Cleveland, Ohio, 1934.

the suffering he will continue to endure, so long as he lives.

The lawyer for the defendant, with as sweet a disposition as he can command, denies this allegation and contends that the litigant has recovered, or will recover, the moment his lawsuit ends. The judge and jury will probably find the truth somewhere between these extreme views. Furthermore, a single incident may prove to be the determining factor in every damage suit. The personality of the claimant, for example, and especially if she is an attractive young woman, may be so impressive, that all the medical testimony in Christendom will not prevent her from winning a reward far out of proportion to her alleged disability. Likewise a litigant, by a single word or deed, may so antagonize a jury that the verdict suffers accordingly.

But, above all, the sympathy or emotions of the jury is the altar at which attorneys kneel and pray, and sometimes the plaintiff finds is necessary to "throw a fit" to have his prayer heard. In any event the lawyer who has cultivated talent and skill in this direction is not much worried when a number of physicians appear against him. All of this constitutes the psychology of the modern damage suit, and in this interesting drama the medical man does not always play a leading role.

WHEN you go into court, discard all fear. If you do not know more about the medical aspects of the disability, than the attorney who will cross examine you, you should not be there. It is a wise physician, however, who looks up the case prior to testifying and refreshes his memory regarding the anatomy and nerve supply of the alleged injured areas. Under all circumstances assume a natural poise and answer all questions honestly. Do not however offer any unasked-for information. Furthermore do not permit anything said or done in the court room to disturb your equipoise. Lawyers do not take these problems seriously, why should you? Simply answer frankly and straight from the shoulder. If you cannot answer a certain question, admit it. If your testimony hurts and the cross examiner attempt to razz you, the judge invariably will protect you.

Above all it is important that the physician and surgeon retain full notes of his observations when called to attend an injured person, and he should make as thorough examination as the condition of the individual warrants. Remember too, that while your first allegiance is to the patient, you are not interested in any lawsuit that may arise. A report of your findings should never be given to the defendant unless the claimant or his relatives are aware of it and give their consent. Several physicians have testified to certain facts in a damage suit which were at variance with the contents of a statement they hurriedly supplied previously, but had forgotten. The physician has no complaint to offer, under such circumstances, if his honesty, there and then is questioned. A certain reputable diagnostician had that experience once and never heard the end of it. He addressed a statement to a local lodge, classifying certain injuries serious, and forgot all about it. Two years afterwards he was summoned to court by the defense and testified the violence was inconsequential and of no serious moment. His certificate was produced and he had to admit having issued it. This incident spread throughout the courthouse and everytime he appears in a case, it is recalled, much to his embarrassment.

IN MEDICOLEGAL practice there are many other angles the inexperienced should know about, if he is to avoid unpleasant complications.

First of all, a physician should never make a complete examination of a woman without her consent. Even then a third person should be present. If an examination is to be made by medical men representing both sides of a controversy, and you are acting for the defense, permit the plaintiff's physicians to make the vaginal investigation first. It is also a safe procedure to examine a virgin through the rectum unless you have full permission to do otherwise.

If you happen to be a radiographer, and an alleged injured foot or hand is to be examined, do not fail to radiograph the opposite member for comparison. A perfectly capable x-ray specialist not long ago radiographed a supposedly maimed foot and reported a serious and irremediable deformity. The roentgenologist called by the defense submitted plates showing a similar deformity in both feet.

Be cautious also in testing surface sensibility with a pin or needle, picked up loosely. Use a pledget of cotton. A well known physician took a pin out of his vest and prodded an alleged palsied arm in four separate places. The claimant, an emotional, unstable woman, declared the arm was completely benumbed. A week thereafter she signed an assault and battery warrant against the doctor and exhibited four beautiful ulcers, the size of a dime. I was present at the examination and saw the arm after the ulcerations had developed. An adjustment was finally made but not until then was it learned that this woman wilfully placed a drop of carbolic acid on each of the four prodded spots. Another instance of the same character, concerned a man who ate a little soap each day to keep him emaciated until his damage suit was settled. He had a mortgage on his home which this suit was expected to lift.

You should also be advised that the introduction of syphilis as a defense in a personal injury lawsuit is always dangerous, even though it is the actual cause of the claimant's disability. Some of the largest verdicts have been returned in cases where such a claim was made. In the first place a physician cannot deny that people afflicted with syphilis may, at the same time, have other diseases and infirmities, and he must also admit that the Wassermann test is not infallible as a diagnostic aid. Then again the courts have ruled that physical violence, plus shock, may bring to the surface a dormant lues, and if the individual had not been traumatized the disease might never have developed.

The attorney for the plaintiff, under such circumstances, takes the position that his client always led an upright, wholesome life, that he previously enjoyed robust health, was never treated for such a disease, was industrious in his work, and perhaps an active churchman. Such a person, in his opinion, could not possibly have acquired so vile a malady. Or he may argue, as a certain prominent lawyer did not long ago, that if it was true his blind client was syphilitic, as the

doctors contended, the condition must have been inherited. The fact, however, that he did not have the privilege of choosing his parents absolves him from all blame. With tears streaming down their faces, the members of the jury took up their deliberations, and in a few minutes brought in a verdict of $45,000.

When examining a claimant for the defense, and the attorney for the plaintiff is present, take special care in making your investigation complete and thorough. Your every move is being noted, and if you are hurried or careless you doubtless will hear about it on the witness stand. It is also a favorite pastime for a cross examiner to have the physician give the length of time he consumed in making the examination. By this he hopes to show you were not as painstaking as his physician.

If you are testifying in behalf of the defendant and you have expressed the opinion that the claimant has recovered and is now normal, the opposing counsel will probably attempt to prove you are prejudiced by asking if his client is a malingerer. Do not fall into this trap unless the general impression prevails that he has exaggerated his condition. The question is best answered by stating that you are not prepared to pass on the litigant's veracity. You can, however, add that your examination proved negative and you could discover no physical basis for his alleged complaints.

When a cross examiner decides to test your knowledge he may read a sentence from a certain book and ask if you agree with it. Request him to read the entire paragraph and tell you when the book was published. If the work is more than five years old, you are well within the truth in asserting that medical science has advanced so rapidly that such a book is practically obsolete. If the edition happens to be of recent date and the paragraph he read is not in harmony with your personal observations and experience, do not hesitate so say so.

Another favorite stunt of attorneys is to inquire if it is not true that medicine is an inexact science and physicians, therefore, are very apt to be mistaken in their professional conclusions. You may concede that his hypothesis is partly correct, as it is human to err, but you doubt very much if doctors are any different from lawyers in that regard. He will then want to know if you are not possibly mistaken in the diagnosis of the case on trial, to which you may reply that you do not think so, because you attended the claimant at the time of the accident, and subsequent thereto, every approved test was utilized and confirmed, and the liklihood of error was eliminated long ago.

Sometimes a cross examiner will attempt to irritate or arouse a physician, by requesting him to name the amount of his fee for testifying. In some instances, judges have sustained an objection to this type of question on the ground that a charge for such service is legitimate and, therefore, has no direct bearing upon the issue involved. When you must answer, do so frankly and honestly, but there will always be the temptation to ask the lawyer if he would be good enough to state what percentage of the hoped-for verdict he plans to withhold for himself, as this would greatly assist you in arriving at a fair charge.

PHYSICIANS should always bear in mind that hearsay evidence can never go into the record of a personal injury case, and, when testifying, they should not intimate that the claimant suffered pains, headaches, etc., unless there are, or were, objective manifestations to confirm them. Pain or headaches cannot be seen or demonstrated, and such conditions are very often pure subjective affairs.

When you have testified on behalf of the defense that the alleged disability is temporary and a full recovery will ensue, you may anticipate a vigorous cross examination, as the plaintiff's petition probably claims a total and permanent physical impairment. If this fails to weaken or discredit your opinion, the attorney may offer to place his client under your professional care and ask if you will guarantee to restore him to normal health. Tell him frankly that medical ethics prohibits such a contract to be made. Only quacks are in a position to guarantee cures.

On the other hand, if you happen to be the family physician of the injured man and, therefore, conversant with his previous history and the state of his health since the casualty, you have testified he is now afflicted with a neurosis which you believe is traumatic in origin, you unquestionably will be asked if it is not true that the element of compensation or "hope of reward," with the worry incident thereto, is the cause, rather than the injury. You may admit in reply that the worry and strain incident to a lawsuit does unfavorably influence the nervous stability of litigants and even the witnesses, but inasmuch as nervousness was no part of the individual's make-up prior to the mishap, you regard the disability as genuine, and not related to the litigation. You should, however, add that a full recovery will gradually follow as no objective symptoms of disease prevail, but you cannot state when, as the reaction to shock and violence differs in people according to their temperament and resistive qualities.

When a physician is summoned into court without a previous consultation, it may be assumed that the attorney hopes to secure his testimony without paying for it, and the doctor who falls for this sort of thing does not value his time and services very highly. Of course you are obliged to respond to a subpoena, but every physician should safeguard his interests by informing the litigant or his representative, prior to the trial, that he cannot afford to appear in court unless adequately compensated, and his charge for testifying will be so much. Your schedule for testifying should be as well regulated as your charge for obstetrical cases, or any similar service, and it is your own fault if you are not properly paid. The attorney very often accepts a retainer and the medical man is entitled to the same protection.

In this connection I may be permitted to state that much of the criticism of doctors in personal injury controversies arises from the testimony they sometimes give on the so-called contingent plan. It is contended that physicians who testify on this basis are interested primarily in the verdict and are, therefore, not impartial witnesses. If this is true, and I believe it is, the blame rests squarely on our shoulders and it is up to us to correct it. There are situations, however, that

right complicate any proposed reform, but it certainly is possible to eliminate the evil if all concerned will cooperate.

In the first place if a damage suit is meritorious and medical testimony is necessary to maintain it, there is no intelligent reason why such service should not be paid for in advance, or guaranteed. It is simply a business proposition. When you drive your disabled automobile into a garage you encounter a sign which reads as follows: "Help us to render more efficient service by refraining from asking credit." Surely the rehabilitation of the human mechanism is a more valuable service than the repair of a motor car, and yet physicians are usually the last to be paid and sometimes never paid. If the garage operator can conduct his department on a sensible basis surely the medical man can do likewise. Unfortunately many doctors in their willingness to be of helpful service lack the stamina to assert their rights, and this explains why they so often are imposed upon.

The problem is further complicated by the fact that when an individual is injured and a lawsuit is inevitable he will defer paying the physician until the case has been settled. This actually obligates the doctor to protect his claim in court, and he should decline to do so until his bill has been paid. Nine times out of 10, payment will be made, either in part or in full, as the litigant is aware how helpless he would be without medical testimony. This is in keeping with sound business principles.

MOST of you doubtless have learned from experience that no two attorneys conduct their cross examinations in the same fashion. Each develops a method which best suits his particular requirements. Some confine themselves to the issue at stake, and their questioning is brief, concise and intelligent. Others are constantly on the alert to catch the unwary off his guard. A certain prominent lawyer, who specializes in personal injury lawsuits invariably asks opposing medical witnesses to name the number of reflexes in the human body and describe the mechanism of the Babinsky reaction, knee jerk and ankle clonus. Another member of the bar places extravagant stress upon the significance of Romberg's sign as an unmistakable indication of spinal disease, especially if the client bruised his back.

Romberg in his original contribution pointed out that patients afflicted with spinal lues swayed three inches or more, when standing erect with eyes closed, and this manifestation in conjunction with Argyll Robertson pupils, girdle sensation, optic atrophy and abolished knee jerks was sufficient to establish a diagnosis of tabes. He also declared that this sign as an isolated phenomenon carries no significance, as persons exposed to profound emotional insults, or even those under the influence of strong drink, sway much more than three inches and are not necessarily suffering from disease, disorder or defect of the spinal cord. The test, therefore, in the absence of other clinical symptoms is not only a subjective affair but also is capable of being voluntarily and wilfully induced. Sometimes I think Romberg would turn over in his grave if he knew to what purposes the sign that bears his honored name is sometimes applied.

Medical witnesses have nothing to dread provided they prepare themselves for cross examination and are willing to stick to the truth irrespective of whom it hurts. Furthermore it will not react unfavorably upon them if they cannot answer all questions. When the doctor is asked a highly technical question or one that concerns some particular branch of medicine with which he is not especially familiar, it is much safer to refer his reply to one who specializes in that department rather than take a chance in answering it incorrectly. Good common sense and self control will usually tide the witness over any possible crisis.

REMEMBER too that you also may be on trial. A neighbor of the judge, for instance, may be a patient of yours, or you may have patients or friends of patients on the jury, and the manner in which you conduct yourself may enhance or impair your professional reputation. Only a few days ago one of our best judges remarked to me that it was always a great help to him to hear from a certain industrial surgeon, as his testimony was so frankly and impartially expressed. For these reasons it is also desirable to utilize intelligent layman's English when describing certain physical and mental conditions. If a joint affliction is an issue, refer to it as a certain type of inflammation to which the term arthritis is usually applied. If the problem is one of "nerves," describe it as a functional nervous disorder known to medicine as a neurosis. By so doing you spare yourself a prolonged cross examination. You should, moreover, have on such occasions a ready knowledge of the major reflexes, the significance of sensory changes (real or assumed), pupillary reactions in health and disease, and the behavior of the Babinsky, Gordon, Chaddox, Oppenheim, clonus, Rumpf's sign, and other well recognized clinical phenomena. You may be interrogated relative to spinal fluid findings, the different phases of blood pressure, and the manifestations of shock, concussion, etc. Finally, be on the alert when possible to anticipate from the first question what the examiner is trying to establish. Being forewarned, so to speak, is being forearmed.

The profession should also appreciate the perils to which they are habitually exposed in the practise of their calling. When the Industrial Commissions went into operation the number of damage claims arising from industrial casualties grew less and less and certain attorneys found it necessary to look elsewhere for their cases. It may be a coincidence, but it is nevertheless true that the number of malpractice suits against physicians has greatly increased since that time. In this regard it is extremely desirable that we prove loyal to each other, remembering that no matter how careful or conscientious we may be, the prospect of a lawsuit is constantly before us. Ninety-nine times out of a hundred a malpractice suit is not honest, and for that reason I have flatly refused to testify against a fellow practitioner, and I never will unless compelled to do so by court order.

It is, therefore, most important that physicians be painstaking in their examinations and especially of all complicated or doubtful cases, and they should call to their assistance every approved clinical aid before a final conclusion is reached. Even then it is a good plan to refrain from

issuing a signed diagnosis until all doubt has been eliminated. Verdicts have been returned against members of our profession for erroneous opinions. Moreover every patient at his first consultation should be subjected to an exhaustive investigation, both physical and mental, and when additional help is necessary, such as blood chemistry, x-ray, etc., the patient should be frankly informed. If this is not supplied the responsibility rests on his shoulders. Damages have also been assessed against doctors for the improper insertion of an intravenous needle, and for many other similar and sometimes unavoidable mishaps. No matter how careful one may be there is always the danger of something going wrong, and we should remember that our mistakes travel faster than our successes. So long as a certain type of people are hungrily awaiting our every misstep, so long must the busy physician protect himself by adequate insurance.

A NEW situation has recently become of interest medicolegally and that concerns the problem of encephalography. It is contended by several responsible clinicians that certain cases of so-called post-traumatic neurosis, are explainable on the basis of organic changes in the brain that can be visualized by encephalography. It is unmistakably true that roentgenographic studies made possible by the lumbar insufflation of air to replace spinal fluid are capable oftentimes of unmasking gross lesions such as neoplasms with startling accuracy, but in the appraisal of diffuse processes the element of error still prevails. This probably is attributable to the fact that deformities of the convolutions while entirely normal, cast shadows which are apt to prove misleading.

During the past two years I have had under close observation two cases in which a diagnosis of post-traumatic neurosis was certainly justifiable. Both were victims of severe concussion without fracture of the skull. Subsequently these patients were subjected to encephalographic investigation which allegedly disclosed cortical brain atrophy. I accepted these findings, but to my utter surprise both individuals made complete recoveries within four months and resumed their usual occupations. In my judgment it is not possible for a degenerative process of this nature to abate in so short a time. We should therefore hesitate to classify post-traumatic neurosis organic until cerebral pneumographic interpretation reaches a higher degree of efficiency. A diagnosis of this sort implies a dark prognosis which if not sound is eminently unjust to the patient and most unfair to the defendant.

In closing, permit me to emphasize that irrespective of the criticisms we hear from time to time, the standing of the medical profession as a whole, in its relations to judicial affairs, is beyond reproach. I am also convinced that physicians have much to gain from association with reputable attorneys, jurists and the courts. It is indeed an experience that broadens the medical man's outlook and assists him in grasping situations promptly and impartially. It is helpful as a builder of poise and control—a ready asset in any branch of human endeavor. In a word it provides instruction in numerous important matters which cannot be obtained from any other source.

The Words Themselves

LANGUAGE, Jargon and Modern Medicine" is the title of the very interesting Presidential Address of Dr. Herbert M. Hurtler, at the opening of the 95th session of the Liverpool Medical Association.*

Dr. Hurtler shows the approximate ages of about 200, mostly modern, medical words. His table has "silicosis" originating in 1891, "pneumokoniosis" in 1890.

Silicosis

BUT Dr. G. G. Davis' "The Pneumonokonioses (Silicosis)—Bibliography and Laws," published last year with the references of the world's literature from 1556 to the end of 1933, shows "silicosis" first mentioned in 1871—Ref. No. 165 being "Rovida, L.: "Un caso di silicosi del polmone con analisi chimica," published at Milan in that year. The next reference is from five years later, 1876.

Pneumokoniosis

AND "pneumokoniosis" dates back to 1567. Ref. No. 2 cites "Paracelsus: Von der Bergsucht, Diligen (Quoted from F. H. Garrison, History of Medicine, 2nd. ed., 1917, 192)."

The second reference—to "de la phthisie pulmonaire"—is from 1831, and there are 17 from dates prior to 1890.

The comparatively recent development of interest in the conditions connoted by both words is apparent from the accompanying lists of the number of references to the literature in each year. Going backward, there are 161 *silicosis* references for the four years from January 1, 1930, to December 31, 1933, with only two more than that, or 163, in the previous decade; while the *pneumonokoniosis* references total 121 for the same four years against 144 for the preceding 10 years. Dr. Davis' book ended with 1933. The 1934 references, much more numerous than in any preceding year, are to be the subject matter of his second book.

Silicosis		Pneumokoniosis			
1871	1	1567	1	1911	1
1876	1	1831	1	1912	4
1897	1	1834	1	1913	1
1909	1	1869	1	1914	6
1911	1	1871	1	1915	2
1915	1	1878	2	1916	2
1916	7	1880	4	1917	2
1919	2	1881	1	1918	1
1920	4	1885	1	1919	4
1921	7	1888	2	1920	2
1922	6	1889	2	1921	8
1923	6	1891	1	1922	12
1924	5	1897	2	1923	11
1925	10	1898	3	1924	15
1926	8	1899	2	1925	15
1927	8	1900	3	1926	9
1928	10	1901	1	1927	16
1929	39	1902	2	1928	18
1930	64	1904	3	1929	17
1931	41	1906	3	1930	33
1932	53	1907	1	1931	33
1933	67	1908	2	1932	47
		1909	1	1933	41
		1910	3		
Total	343			Total	334

Yearly No. of References to "Silicosis" and "Pneumokoniosis" "The Pneumonokonioses (Silicosis)—Bibliography and Laws"

* Published in the *Liverpool Medico-Chirurgical Journal*, Vol. XLII, Part I, 1934.

The Medical Department Manual

—The Complete Handbook of Organization, Operation and Routines Representing Actual Experience and Practice of 20 Years—

by

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SECTIONS Published:
I. History of the Medical Department *(January,* 1934);
II. Physical Property;
III. Personnel *(February,* 1934).
IV. Functions and Routines;
V. The Centralized Medical Department;
VI. Subjective and Objective Relations;
VII. Research *(March,* 1934).
VIII. Forms *(April,* 1934).
IX. General Instructions to Examining Surgeons;
X. Classifications of Physical Defects;
XI. Classifications for the Reviewing Surgeon *(May,* 1934).
XII. Regulations and Requirements Governing Physical Examinations;
XIII. Interpretation of Physical Defects of Employees for Department Executives *(June,* 1934).
XIV. Requirements of a Course in Industrial Medicine and Surgery (*February,* 1935).

Sections in This Issue:
XV. First Aid in Industry.

Sections in Subsequent Issues:
XVI. Sanitation in Industry.
XVII. The Nurse in Industry.
XVIII. Industrial Medicine and Surgery; Its Past and Present Status.
XIX. How the Medical Department Can Be a Factor in the Reduction of Absenteeism.

XV. First Aid in Industry

FIRST AID has rightfully been placed in the hands of the medical profession, which by reason of its education and experience is best able to cope with the situations that arise in industry. The history of first aid shows that before the war this work in industry was carried on by nurses and untrained laymen, without the services of medical men, the main reason being the employers' desire to save money. Such first aid treatment was incompetent, and many deplorable and disabling complications resulted. The fault was not that of the first aid men but of their employers, who furnished medical and surgical supplies but not the proper training for their use. These men did the best they knew how, as it is man's natural desire to aid a fellow man in distress, and while many times their work was efficient and valuable, any ill results of their treatment should be charged up to ignorance.

First aid as it existed in industry before the war was not looked upon with favor by the medical profession, and even the laymen themselves discouraged its practice. However, a new attiude toward first aid instruction to layment was developed out of the war. It was found that there were not sufficient medical men to serve the many ills and wounds that war carries with it, and it was necessary to give the soldiers assistance either to themselves or through them to their comrades in time of emergency. Such first aid treatment proved very valuable—in fact many of those wounded in action would not be living today but for the fact that their comrades applied the principles of first aid.

Industry was quick to see the value of training employees in first aid to render assistance to the injured, especially in isolated places that required a long time to be reached by a doctor. The necessity of having first aid trained employees is more apparent in the electrical and railroad transportation industries on account of the widely scattered territory served by them as well as the nature of the accidents that occur in the operation of these industries, such as electric shock, which calls for immediate action if the injured is to live. The industries served by our Medical Department have a definite first aid policy, which had its inception 17 years ago on the Elevated Railroads in Chicago, and the great value of first aid work as an economic factor in these industries is apparent today in the large number of lives saved and the countless number of cases where meritorious first aid service was rendered to employees and the public in time of emergency.

In establishing a first aid policy, the items to be taken into consideration are the location of the industry as to accessiblity by doctors, the nature of the work of the industry, and the severity of the injuries most frequently occurring. The first step taken by our Medical Department towards arriving at a first aid system was to establish at various locations suitable first aid equipment to meet the emergencies that arose in the course of the daily work. The records of all accidents of the three years preceding 1913 were secured, and each accident and its location were recorded on a map of the physical property of the company. The graph method of using colored pins to designate the different kinds of injuries was employed, so that the nature of and the places where accidents occurred most frequently could be determined. It was found that first aid stations were necessary at shops, towers, terminals, switch and storage yards, dispatchers' offices, and certain pasenger stations. Trivial injuries, such as cuts, scratches, etc., to the hands and fingers, occurred most frequently; bruises, contusions and strains to the lower extremities next; electric burns to the face and upper extremities third; foreign bodies and electric flashes to the eyes fourth; fractures of the lower extremities fifth, while electric shock was the last but most severe injury listed as possible fatality. Included in this list are fainting attacks, epileptic fits and head injuries, which had to be taken into consideration in selecting first aid equipment.

From a study of these injuries, the following contents were decided upon as necessary for the first aid box:

4—one-inch gauze bandage rolls for finger injuries;
4—two-inch gauze bandage rolls for hands, face and feet injuries:
4—three-inch gauze bandage rolls for electrical burns and large injuries of extremities and for tying splints in fracture work;
1—two-ounce carton of sterile cotton for iodine swabs, reinforcing burn dressings, splint paddings;
2—cartons, one yard of sterile gauze for burn or wound dressings;
1—one-inch spool of adhesive plaster for securing bandages and dressing;
2—ounces of 2% iodine in amber-colored bottle, rubber-corked and carrying date of issue;
2—ounces spirits of ammonia for shock and fainting cases;
2—ounces of sterile petrolatum for burn dressings;
2—ounces of boracic acid eye-water with medicine dropper for wounds of eyes and foreign bodies;
1—pair of blunt-pointed scissors;
1—first aid booklet;
1—pad first aid requisition blanks for supplies;
1—record card, to record cases treated out of the box;
1—bottle containing 30 sterile cotton applicators for iodine application;
1—bar of germicidal soap for the first aid man to use in washing his own hands before treating;
1—tourniquet for controlling hemorrhage;
1—metal first aid box, portable; and
1—set on instruction on the lid of the first aid box.

The contents of our first aid boxes today are the same as hereinbefore listed, with the exception that iodine in ampoule form has been substituted in boxes which are not used frequently. Where conditions warrant, the two-ounce bottle of iodine is furnished. The dating of the iodine assures that it will be picked up after one month, thus avoiding the possibility of its becoming concentrated and causing burns. From 1913 to 1928 we have had no burns from iodine, due to the proper supervision of this antiseptic. We have experimented with other antiseptics but by popular request of employees have discontinued using it and returned to the use of iodine. The gauze as furnished for first aid boxes today is in sterile envelopes of 24 inches square folded three times, instead of in cartons.

Regulation U. S. Army stretchers with woolen army blankets were next installed at each of the first aid stations for transporting injured people. The stretcher and blanket were placed in a steel cylinder, painted red and marked. It was essential that the locations of stations be made known to employees, so there would be no delay in time of emergency. A first aid station marker was designed, as follows: a solid red circle on a white background encircled by an inch-wide green band, with the words "First Aid Station" on the lower margin.

Employees in charge of first aid locations on day and night duty are responsible for keeping them completely equipped. A system was inaugurated of sending a report and requisition once a week to the Medical Department for supplies that are needed, and once each month an inspection is made by the department supervisors who check up on the equipment and its condition. The Director of First Aid from the Medical Department makes a careful inspection quarterly of all first aid stations. This method of inspection and supervision assures complete equipment for any emergency. As the needs arise, additional first aid locations are established.

The most difficult phase of the problem was that of selecting and training employees who would function in time of emergency until the doctor arrived. A first aid school was established, and a course of lectures and demonstrations on first aid was compiled. As all first aid manuals in existence at that time were either insufficient or too complicated to meet our needs, we compiled our own manual containing the essential first aid principles, worded in simple, non-medical terms. We relied upon the lectures and demonstrations to carry the story to the employee. The course required an attendance of two hours one day each week for three months or 20 hours. This was later reduced to 16 hours, which is in effect at the present time. After the course of lectures and study of the textbook, students are required to demonstrate the principles of first aid and pass an examination before they are certified for graduation and a diploma. The classes consist of an average of 30 students each, and each division of every company has a first aid class in continuous operation throughout the year, men and women being in separate classes. Graduation is held once a year at one of the large loop hotels for all students successfully passing the prescribed course, followed by a banquet and vaudeville entertainment, and a diploma signed by the President, General Manager and Chief Surgeon is presented to each graduate. The Britton I. Budd gold medal for the saving of human life is also presented at this banquet to employees who have saved life either by rescue or by first aid service.

Employees who attend first aid classes are selected from those who have been in the service for a length of time to assure of their remaining indefinitely with the company. Personal appearance, cleanliness, tactfulness and ability to remain calm under stress are qualities looked for in choosing students. Tendency towards leadership and ability to disseminate the information imparted to them are added assets. It is essential that the employment of first aid men keep them on duty continuously during the day or night. This training makes them valuable assistants to the doctor in time of accident, they become disciples of safety and health, and they spread health propaganda among other employees.

The first aid course of instruction covers resuscitation by artificial respiration in cases of electric shock, drowning and asphyxiation from gas of carbon monoxide, methods of entering smoke and gas filled rooms, methods of controlling arterial bleeding and treating the resulting shock, immobilization of fractured limbs and methods of transporting persons so injured, treating of unconscious cases until arrival of the doctor, methods of bandaging, and the care of lacerations in an aseptic manner.

It is far better to give a simple course of first aid instruction, visualized to the employee by demonstrations to and by the student, until he is perfect in applying the same. Select for a teacher a medical man who understands first aid work from actual experience, and not one of the so-called first aid lecturers who has never used a surgical instrument but teaches only from theory. There are organizations that teach first aid to industrial and lay students for a consideration, but theory instead of actual practice governs their teaching, and they are more concerned with turning out a large number of students and securing new students than with their training, with the result that the students are incompetent for first aid work. It is best

that an industry have its own first aid school for employees, since they are more familiar with the conditions and policy of the company, rather than to have outsiders come into the organization and try to force their theories and methods into the routine of the company. After once teaching an employee the principles of first aid, it is important that he be given an opportunity to brush up on his knowledge so as to be fit to act in an emergency. For this purpose, actual practice demonstrations are frequently held, and employees in different departments devote a certain amount of time each week to the practice of first aid principles.

While our first aid service was primarily for the benefit of employees, its scope has become so enlarged that it now extends to the general public, on the street and in the home, and many medals have been awarded for meritorious acts occurring away from the company's property. The demand by other industries, schools, churches, clubs and associations for first aid demonstrations to their employees or members became so great that first aid teams, composed of both men and women, were organized for the purpose of public demonstrations in Chicago and surrounding cities. The teams are composed of from five to 20 members each, the size depending on the number of persons before whom the demonstrations are made, and the performance lasts from 15 minutes to an hour. Both the men's and girls' teams wear attractive uniforms, and their reputation has spread over the United States and Canada.

Once a year inter-departmental contests are held between the teams of each company, and an inter-company contest is held between the champions. In 1924, 1925 and 1928 the teams of the Chicago Rapid Transit Company won the championship of the City of Chicago in a contest held under the auspices of the American Red Cross between the utility companies of the city.

First aid, consisting of carefully trained employees, together with the proper equipment and the cooperation of the officials of the organization, has proved its great value in industry, and the results are best summed up as follows: First aid

1. Assures every employee and customer of receiving immediate attention in time of injury until the arrival of the doctor, minimizing or dispelling pain;
2. Reduces fatalities, as immediate aid often determines whether or not the patient will live, and ignorance of the methods of rescue from various elements results in a fatality;
3. Encourages employees to safeguard their health and life, and not to neglect trivial symptoms;
4. Minimizes infections from lacerations, scratches, etc.;
5. Reduces the compounding of simple fracture by intelligent handling and splinting;
6. Reduces the period of convalescence from injury by treating shock, controlling bleeding, etc.;
7. Assures of adequate supplies for the treating of emergencies, and facilities for making the injured comfortable at the place of accident;
8. Assures of transporting a patient to the doctor's office or the hospital in a correct and efficient manner;
9. Lessens delay in securing a physician's services;
10. Increases the confidence of the layman in the medical profession;
11. Strengthens employee and public relations;
12. Makes each employee his brother's keeper, and encourages safe practices.

"Surgeon" and "Physician"

THE word surgeon is much younger than the word leech. During the six centuries of its history, it has been spelled in 30 different ways. In the same period of time (600 years) its more classical sounding synonym chirurgeon, whose adjective we perpetuate in the title of our journal, has known 15 different spellings. A hand man is all that surgeon means etymologically, and in its youth the word had not much of dignity or glory about it. Did not Edward IV incorporate the Company of Barber-Surgeons in 1461 A. D.? But when not hyphened with inferior company, the word did for some centuries mean any member of our profession and not necessarily one who treated solely or mainly by manual operation. Even as late as A.D. 1880 when Sir James Paget began his well-known memoirs he could write 'It was decided that I should be a Surgeon—meaning a general practitioner.'

"Since 1880 specialism has advanced and the word surgeon has been appropriated by one of its branches. The word is now too much associated in the public mind with scalpels and cutting operations, with theatres, with white gowns and skull-caps, and also perhaps—though this should alas be expressed in the past tense—with fabulous emoluments, to be any longer a suitable designation for the less exalted members of our profession whose services are less expert in proportion as they are more varied.

"Physician is a slightly older word than surgeon. It came to us spelled with an 'f' soon after the Norman Conquest. As recently as the sixteenth century it was spelled with a 'v'. Thus in 1526 Tindall. translating Luke iv. 23 wrote 'Visicion heale thy silfe. . . .' Like surgeon it long remained a generic term — as it still does in America—and by no means excluded those who performed operations; indeed it is obvious from an Act of Parliament passed in the reign of Henry VIII that surgery was officially regarded as a branch of a physician's work. That Act (A. D. 1540) says 'Forasmuche as the science of phisicke dothe comprehend the knowledge of surgery as a special membre and parte of the same, therefore be it enacted that any of said Company or felawiship of Phisitions . . . may exercise the said science of Phisik in all and every his (its) membres and partes'. The Oxford Dictionary quotes Woodall as saying in 1612, 'The more learned sort are justly stiled by the title of Physicians, and the more experienced sort are called Chirurgeons or Surgeons.'

"From a linguistic point of view it is to be regretted that the words physician and surgeon should have been allowed, at all events in the medical parlance of the British Isles, to become sharply antithetical. The language has thereby lost in physician—as it earlier lost in leech—a not wholly unsuitable term for any and every member of our profession."—From "Language, Jargon and Modern Medicine," by Herbert R. Hurtler, M.D., in *The Liverpool Medico-Chirurgical Journal*, Vol. XLII, Part I, 1934.

Misinterpreted X-Rays

—With Special Reference to the Odontoid—

by

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WE HAVE had an epidemic of odontoid fractures, several cases of which have gone to court. I have been interested in fractures of the cervical vertebrae for about 20 years but have never found a fracture of the odontoid. I have seen a great many x-rays of *alleged* fractures of the odontoid.

Odontoid Process — Anteroposterior View, Through Mouth.

In 1932 while attending a fracture demonstration in St. Louis, I saw demonstrated a supposed fracture of the odontoid. The patient was a strong, round-shouldered Italian, who had fallen from the side of an auto truck to the street level, a distance of four or five feet, sustaining bruises with a fracture which was diagnosed by both the roentgenologists and the surgeons as a fracture of the odontoid process.

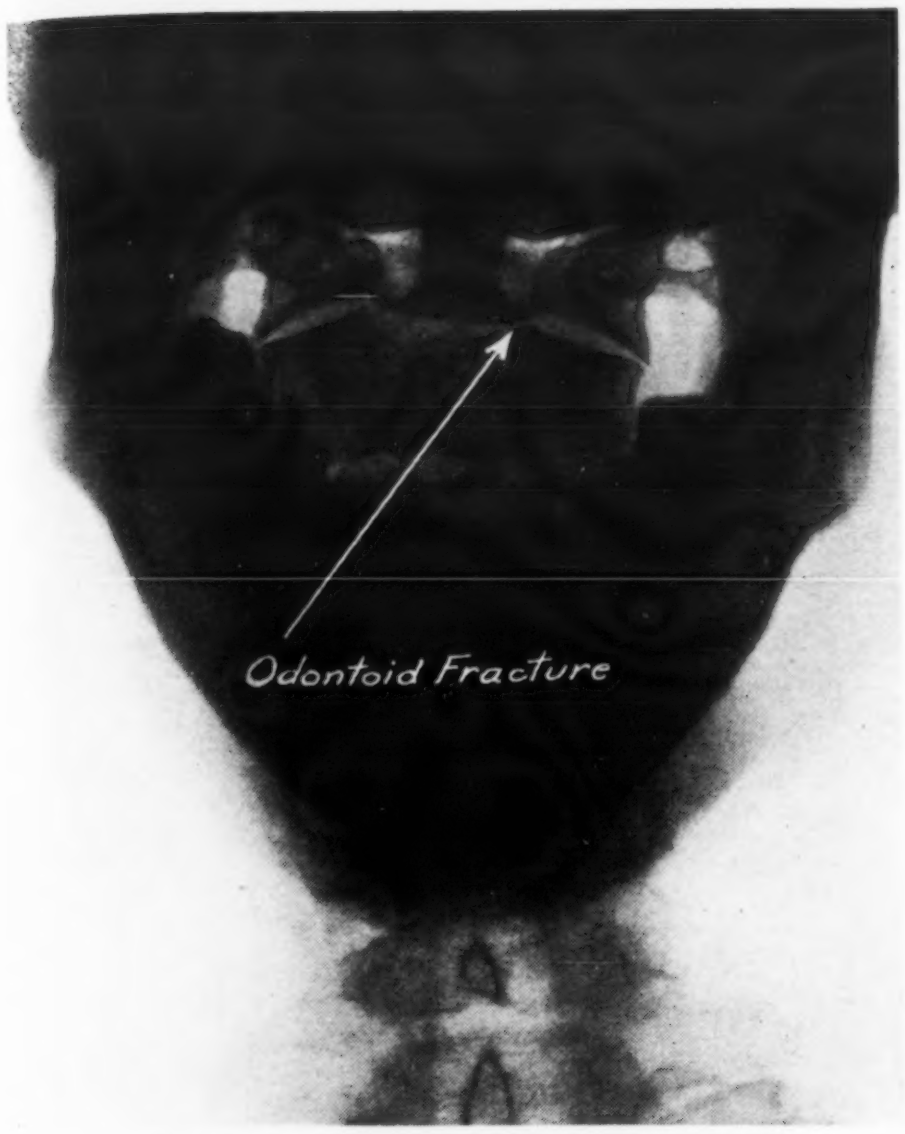
He did not have a fracture of the odontoid. A man diving into a pool or falling directly on his head or neck might sustain a fracture of the odontoid.

This situation as in St. Louis, has been repeated all over the United States—roentgenologists taking pictures and thinking they have a fracture of the odontoid. It is a distressing matter, not only for the future of the patient, but also because of the price that has to be paid for some of these alleged odontoid fractures.

There are many different ways of taking pictures to demonstrate a fracture of the odontoid. The technician in our office took the picture of the odontoid process shown on this page, while making a sinus picture, by raying directly downward. It seems to me that when you think you have a fracture of the odontoid, if you go over the skeleton and see how nicely the odontoid is protected and what might be fractured before the odontoid, I feel sure you will think twice be-

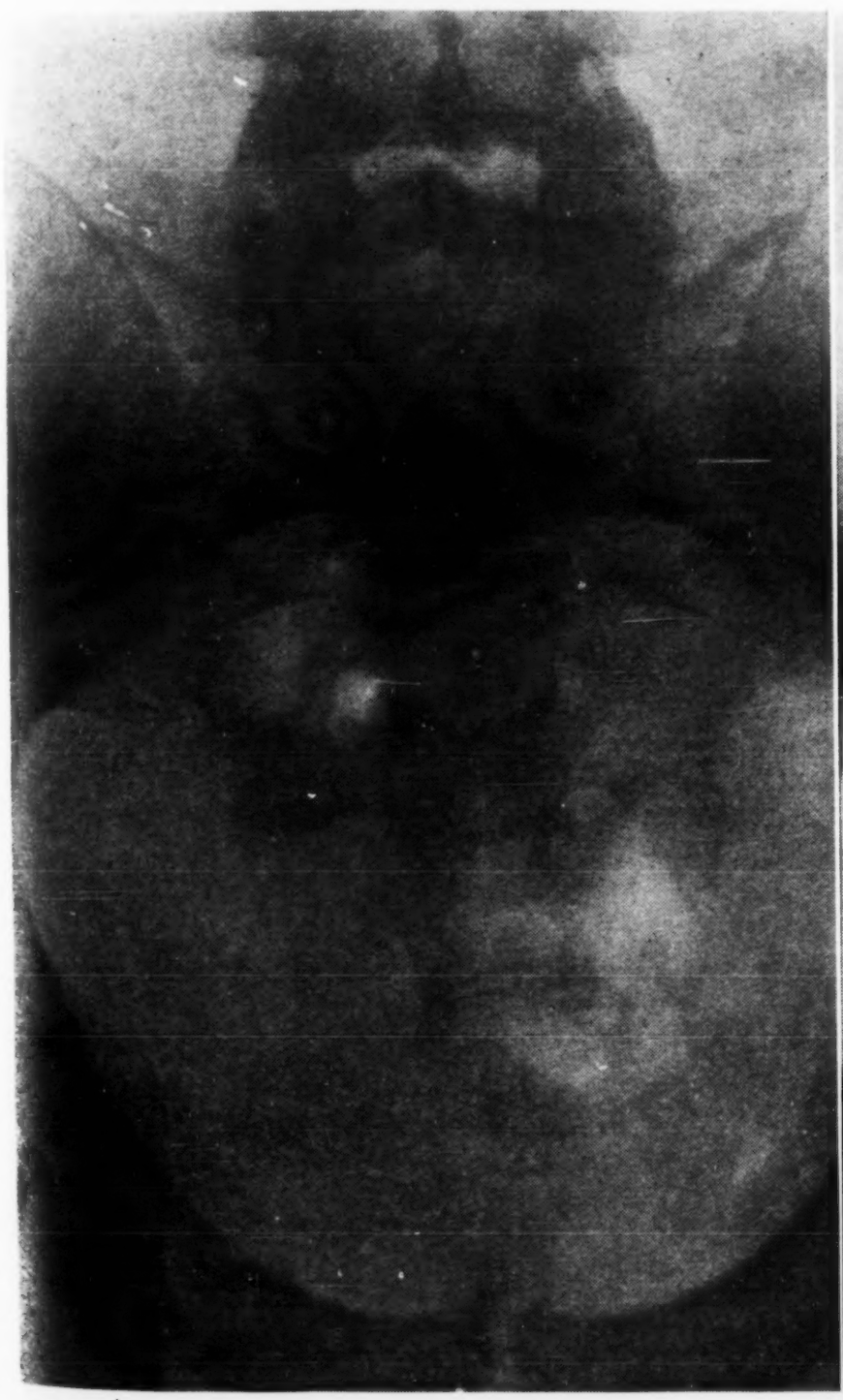
Odontoid Process—Posterior-Anterior View, Through Top of Head (Same as Sinus Picture is Made).

* Read before the Central States Society of Industrial Medicine and Surgery, Cook County Hospital, February 26, 1935.



Transverse Fracture, Base of Odontoid
(Referred by Dr. Melton B. Burns, Chicago)

Spondylolisthesis (Age 20)



This was Diagnosed as a Fracture of Fifth Lumbar Vertebra

It was a Spina Bifida Occulta of Fifth Lumbar Vertebra

Autopsy Proved Silicosis Not Complicated by Miliary Tuberculosis.

fore you make a diagnosis of fracture of the odontoid process, unless you have a history of an accident that might do some damage to the odontoid.

The pictures on pp. 132 and 133 bring out the odontoid process very well. The anteroposterior view, taken with the mouth open, is rarely of any value, and the lateral picture gives very little information. I have an anteroposterior picture taken through the mouth, which was thought to be the only way of demonstrating the odontoid some years ago. This is practically a duplicate of the picture referred to as shown at St. Louis. That picture would be a beautiful one to demonstrate a fracture of the odontoid in court, but it has been read by a number of roentgenologists and has been pronounced entirely negative.

When you have a suspected cervical vertebra injury, I believe it is worth while to bear in mind this picture of the odontoid, as well as the fact that the alar ligaments tear when a fracture of the odontoid occurs. This is, as a rule, impossible. If the odontoid is fractured, it will be noted it is not in the center of the oval or the atlas[1].

I am bringing this to your minds because it has been a troublesome question, and as traumatic surgeons, we ought to meet these problems. The roentgenologists should make the diagnosis, and if their diagnosis does not correspond with the history and the findings, another examination should be made. After all the surgeon is the one to arrive at the final conclusion.

The picture at lower left on p. 133 is a spina bifida occulta diagnosed as a fracture of the fifth lumbar vetebra.

This diagnosis was made on one flat film, and the case came to the industrial court. The possibility of spina bifida occulta should be borne in mind in disturbances about the fifth lumbar vertebra.

I have one more subject to mention and that is silicosis. One day, a man walked into our office with a dry tongue, shortness of breath, and said he

1. Cunningham, p. 311.

Silicosis Not Complicated by Tuberculosis.

was sick. We started looking him over, and in the meantime the picture on this page was taken. He gave a history of having worked for 20 years as a sand-blaster and emery grinder in a machine shop.

This is the most beautiful picture I have ever seen showing a real case of silicosis not complicated by tuberculosis. I show this picture to emphasize the fact that occasionally we do have a case of silicosis without a complicating tuberculosis.

This man was pale and anemic looking, but did not seem acutely ill. Head, neck, eyes, chest, extremities, reflexes and nervous system appeared normal. Lung examination revealed nothing extraordinary excepting a small patch of dullness on the left side over the lower portion of the upper lobe in the axillary line. Weight two years ago, 175—present 156. Blood pressure 120/80; pulse 86; respiration 24; temperature normal. Urinalysis entirely normal. Heart, no murmurs; rate regular, and quality fair. *Blood analysis*: red cells, 3,240,000; white cells, 6,900; hemoglobin, 65%; *Differential*: polynuclear-neutrophiles, 64%; lymphocytes, 34%; basophils, 2%.

X-ray examination of the chest revealed many small white patches varying in size from a pin point to the size of the tip of a large lead pencil distributed throughout the entire lung tissue, more marked in the peripheral areas and base than in the central and apical regions. The lymph glands in the mediastinal regions are remarkably clear and free from calcification and fibrosis. The diaphragm markings are normal and there does not appear to be a great deal of fibrosis of the pleura.

Modern Industrial Surgery

—As to Some Aspects of Which a Surgeon Speaks His Mind—

by

MARSHALL J. PAYNE, M.D.

INDUSTRIAL SURGERY has projected itself into a field, or specialty, all its own. In importance it has advanced above the other branches of the healing art. Military surgery had only in times of war, must yield rank to industrial surgery had in time of war and peace. The military surgeon is not called upon in times of war to express a medicolegal opinion, or to state the aspects of disability. The industrial surgeon, on the other hand is confronted almost daily with the necessity which he cannot escape, of describing the nature and consequences of injuries. The great army of injured furnish many new and perplexing problems for the surgeon. At times, it may be difficult or impossible for the surgeon accurately to estimate the extent and fully fix the amount of the permanent or total disability. Under modern compensation laws, the injured have developed a psychology peculiarly all their own.

It is not always possible to estimate the true disability on account of the attitude of the injured individual. Illustration: A negro lad, aged 19, sustained a fracture of the terminal phalanx of the right small toe. After full healing of the fracture, he complained of pain whenever seen or examined by the surgeon, yet he was able to play ball in a rough field immediately prior to and after the surgeon's visit. The attitude of the injured must be fully appreciated and understood. For example, recently a claimant was carefully examined to determine his fitness for resuming his work. When claimant was told that he had fully recovered and was able to return to work, and that the company would be so informed, he said: "Doc, give me another week."

The principles of industrial surgery are not different from the principles of general surgery. Yet the practice of traumatic surgery demands mature judgment and careful reasoning. Indeed the very nature of the injury may demand the exercise of the highest type of skill and the application of surgical principles more wisely than any other surgical condition, in order that successful management of the case may be obtained.

At times, it is almost impossible to understand a claimant's reaction to the injury and the consequences of the accident under compensation laws. This attitude on the part of the injured claimant is fraught with added responsibility and difficulty to the surgeon.

It might be well to mention something that is present in almost every human being which blights many of the better things in life. I mean the matter-of-fact attitude; the taking of things for granted, simply because of constant contact. Because of continued or constant contact we may fail often to appreciate and evaluate their actual worth. Valuable experiences are often taken as a matter of course; and, because of not being extraordinary, a sufficient impression is not made upon us.

In order that I may make clear some important points in the consideration of the subject, I shall briefly discuss several illustrative cases which are taken from my own experiences. In this way the necessity for careful scrutiny of all cases of injuries, regardless of the severity of the injury, may be emphasized.

IMAGINE my surprise when told recently by an industrial commissioner that the commission had "heard 5,000 cases of hernia and knew all about hernia." I wonder if the legal mind is better able to understand the intricacies of hernia than the trained surgical mind. I should like very much for the commissioner to make clear the differential diagnosis of an undescended testicle complicated by a congenital hernia and an undescended testicle lying in the inguinal canal complicated by a recently developed hernia. Called upon to treat these possible conditions, all recently observed by the writer, I am sure an intelligent commissioner would exclaim: "Surely, every hernia case must be a law unto itself."

It is possible for an intentional, fallacious diagnosis of hernia to be made. Illustrative case: In a compensation case heard before an industrial commissioner, claimant's witnesses testified that claimant some 10 months previously had had a hernia operation; that about eight months afterwards, while lifting overhead a coil of pipe, a new hernia developed on the same side. The surgeon testifying for the claimant had not seen the patient prior to the hernia operation, neither had he performed nor seen the operation for the hernia. Yet he was willing to state under oath on the witness stand that it was an entirely new hernia and that the new hernia was at least one and three-fourths inches from the site of the former hernia. One may marvel at such diagnostic skill.

The object of such testimony was to convince the commission that it was a traumatic hernia, which was not connected in any way with the former hernia and thereby obtain compensation for claimant. The defense sought to introduce testimony to show that the case was simply one of a recurrent hernia. However, the effort to set forth the causes and development of recurrent hernia and the explanation of the same was denied by the commission. It would appear that both the commission and claimant's expert testimony were erroneous. It would be well, therefore, for the industrial surgeon to refresh his knowledge on the frequency, possibilities of, and causes of recurrent hernia.

One of the outstanding requirements of the medical or surgical witness is scientific honesty. It is often apparent that clear, truthful, and scientific reasoning is not fully understood by the courts and industrial commissions and is made to yield to plausible assumption. The surgeon should

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* Dr. Marshall J. Payne, of Staunton, Va., is President of the Association of Surgeons of the Norfolk & Western Railway. This paper, with his addition here of two cases, is reprinted with his permission from *International Journal of Medicine and Surgery*, November, 1934.

seriously consider the effects of such erroneous practice and findings.

The frequency of recurrent hernia is somewhere between six-tenths of one percent and 25%. "There are more failures after hernia operation than ordinarily admitted." I have seen two recurrences in the same patient who was operated on in one of the best hospitals in the country. Recurrences, in the work of everyone, do occur; and frank, truthful admission of the fact is essential in any intelligent discussion of the subject. We may well seek to know the causes of failure of operation for hernia, for only in this way may we find some method whereby all hernias may safely be cured by operation.

In the study of this subject the first essential requirement is a proper understanding of the causes of failure to cure hernia by operation. For convenience, I classify the causes of hernia:

1. ANATOMICAL. By anatomical, I mean the arrangement of the structures entering into formation of the hernial areas. When one considers the anatomical arrangement and the embryological sequence in the development of the structures having a part in the inguinal rings and canal, and the descent of the testicle from the peritoneal cavity in the embryo, the frequent occurrence of hernia is not surprising. The persistence of a patent (open) funicular process (the canal of Nuck) a potential hernial sac is accepted, at this time, as the adequate underlying factor of at least 90% of oblique hernia. Ten to 12% of adult males have an open funicular process. (Nelsons, Surgery Vol. 4, page 596.) Similarly in the female, the canal of Nuck is found open to a somewhat larger percentage; at least 10 to 25%. (Same reference.)

2. ACQUIRED. By acquired, I mean the sudden increase of abdominal pressure brought about by muscular efforts, strains, falls, lifting, etc., and the forcing of the omentum or a loop of intestine against or into the patent funicular process, and poor musculature brought about by poor health or by constant or intermittent pressure against the parts. It is said that the passing of the examiner's finger into the inguinal canal is sufficient to excite in some cases, the formation of a hernia.

In consideration of the factors entering into recurrent hernia, bear in mind the factors entering into the development of a primary hernia; and, in addition, understand that the operation undertaken for the cure of the primary hernia failed to restore the anatomical structures. It is the failure of the restoration of the anatomical arrangement that causes a recurrence. The causes for such failure are many. Yet all of the causes may be grouped into a simple statement —an improper operation and failure to secure proper tissue repair or union of the parts.

For some time past I have made it a rule when operating for hernia on women, to excise the part of the round ligament lying in the inguinal canal and suture the cut end to the deep surface of the internal ring and then close the inguinal canal securely. In direct hernia and in recurrent hernia, I have usually stitched the edge of the conjoined tendon to the periosteum of the superior surface of the public ramus, and then also followed the Bassani operation with a slight modification. The modification consists of suturing the lower flap of the external oblique to the anterior face of the conjoined tendon and arch. This plan puts an added layer of tissue posterior to the cord. No difficulty will be experienced now in covering the cord by bringing down the upper flap of the external oblique and suturing it to the anterior face of the lower flap of the external oblique. The results were good.

THE opinions of the courts and industrial commissions based upon improper conclusions, unscientific reasoning, unwarranted assumptions, without full investigation, bring discredit to our profession and injustice to interested parties. For example, at a hearing before the industrial commission it was testified that a white married man, aged 37, while engaged in his regular work, scratched his right index finger. On the next day he received medical attention for a cellulitis of the finger. The treatment being given was "poulticing and then incision." There was further testimony that, at about the same time that the finger healed, the patient presented symptoms of general sepsis, which localized in the prostate gland. The consulting surgeon testified that he was "personally convinced that the claimant's condition was a prostatitis, and that the prostatitis was evidently metastatic from the infected finger of traumatic origin."

The evidence presented for the defense was briefly: The existence of metastasis should be proved by bacteriological examination and demonstration of the presence of an organism in the wound secretions from the finger, in the blood and in the secretions from the prostate gland, and that the organism identified should be identical in each instance. No such bacteriological examination was made. Hence scientific proof of metastasis was lacking and the assertion was an unfair assumption. Further, that while gonorrhoea is the most common cause for prostatitis, yet no careful surgeon would testify that the case in question was gonorrhoeal in origin, without a bacteriological examination and demonstration of the characteristic organism. That in case of an alleged metastatic prostatitis from an infected finger or wound of a remote part of the body, scientific care in examination and conclusion is demanded, before admitting a diagnosis of metastasis. Clearly it was an injustice to the defense to admit and accept a diagnosis based on pure assumption. Nevertheless, the commission thought differently and claimant was given compensation. Such a ruling was not warranted.

It is not possible for courts and commissions of non-medical men accurately to decide medical or surgical problems. The procedure is wrong in principle and harmful in practice. A court of impartial medical or surgical men should be consulted in cases in which medical or surgical conditions are to be determined. Jurists should decide points of law involved in personal injury cases. Competent and impartial medical men should pass on the medical aspects of the case. Any other plan is fundamentally wrong, and should be abolished.

An illustration may be helpful. A female telephone exchange operator while at work at a switchboard received an electric shock and was slightly burned about the neck. A high tension wire fell across a telephone line, and an arc in

the ear-piece cord resulted: a spark striking the neck of the operator. Healing of the burn took place without incidence, leaving no scar. However, a highly neurotic state developed with "fixation of ideas" connected with sensory and mental symptoms, not consistent with the primary injury. A careful physical and mental examination failed to show any organic changes or abnormality. Claimant remained at her parents' home receiving compensation. In comparison to her salary, the compensation and lack of expenses afforded somewhat better income than her salary while at work. This advantage was not overlooked by claimant. Before the industrial commission evidence was introduced to show that claimant had made a satisfactory mental adjustment; that no physical or mental disability remained; and that she was able to resume her work as a telephone operator. At the hearing the claimant was put on the stand. At the first question propounded to her, she broke down, cried and failed to answer or make any further replies. Thereupon she was excused and "an order" for the claimant was entered continuing her compensation, which was what claimant wanted.

It is evident therefore, that industrial commissions and courts should know how people react and behave when frightened or in pain. At times, considerable doubt may be entertained with reference to the truthfulness of the evidence and opinions expressed by medical witnesses. Indeed, we may be inclined to look with considerable skepticism at evidence submitted by claimant's expert or medical witnesses. In discussion of debatable subjects, careful consideration of the clinical experience of many observers and their conclusions should be studied before a final opinion is reached. Great care and caution should be exercised in all cases in order that our own conclusions may not be successfully attacked.

IT IS needful that industrial surgeons should be familiar with the power and right of industrial commissions to directly order and fix, in certain cases, plans of treatment for the injured. This power granted industrial commissions is a distinct and new departure. The results of the exercises of such legal control and direction over the practices of the surgical art cannot yet be foretold. Is this truly state medicine?

The following case illustrates the problem which must often confront the industrial surgeon:

W. L. W., a white, married, male, 37 years of age, laborer, sustained an injury to the right index finger May 11, 1934. Disability began May 16, 1934. The complainant first presented himself for treatment May 21, 1934. The treatment comprised an incision and drainage of the end of the index finger for a thecal abscess, without involvement of the bone. Healing was prompt though with some considerable loss of the pulp of the finger. Complainant was allowed compensation for temporary disability. The complainant had suffered previously and for a number of years with anchylosis at an angle of approximately 90 degrees of the left knee joint.

Complainant's principal complaint was: Pain and tenderness of the end of the right index finger, the pain being present during the night and not present during the day.

This case finally came to a hearing before the industrial commission. The complainant's statements and the medical evidences introduced by the complainant all were more or less conflicting as to the cause, nature, and extent of complainant's principal complaint.

The author presented the case for the insuring company and demonstrated to the court that the wound was firmly healed, that no anchylosis of the index finger was present, that the function of the finger was preserved, that it was always vitally important to preserve the function of the fingers, especially the index finger and the thumb, and that doubt existed as to the nature and extent of the pain complained of, and that the pain was probably psychic.

It appeared and was disclosed from intelligent questions and observation that the court was fully aware of the true aspect of the case, yet, "An order was issued that complainant's finger be amputated at the distal joint and that the insuring company assume the cost therefor and for compensation for loss of the terminal phalange of the right index finger." Industrial surgeons should be concerned in this far-reaching question here proposed. A loss of the terminal phalange entails 50% of the loss of the entire finger. Should industrial surgeons amputate contrary to surgical experience and judgment, in doubtful cases of pain only, or follow the order of industrial commissions? Does it not appear that surgeons should follow the dictates of their own judgment?

THE following case illustrates the imperative need for careful autopsies in cases of death due to accident involving claims for compensation or damages. Careful history, searching physical examination, laboratory examination, and autopsy findings should be had in all accident cases followed by death involving claims for compensation or damages. It does not appear in this case that an accurate clinical diagnosis was made and from a study of the clinical history presented the final diagnosis and stated cause of death was not fully correct.

It appears therefore that, in all cases of death attended by accidental injury involving settlements for claims, it is fair and equitable for all parties concerned that final proof of death be attested by autopsy findings.

G. H. Case 61920—R.A. Automobile injury sustained June 12, 1934.

History: The injured was not rendered unconscious, walked with assistance, slight wound on head dressed, and showed interest in circumstances of the accident. August 25, 1934, patient was admitted to the hospital, where he died August 31, 1934. The certificate of death showed the cause of death as "uremia" and the contributory cause prostatic enlargement. Evidence also disclosed that "sinus trouble" existed.

The injured estate, through attorney, now represents that the actual cause of death was "cerebral hemorrhage," and this conclusion was based on the fact that "the deceased continuously suffered from the date of the accident with pains in the head." It further appears that the injured could not do any work, that his lower limbs would give way and that at times his mind was blank, that he had no interest in anything and that a few days prior to death he lost the use of

both legs. No autopsy in this case was made.

The compensation statutes, notably Indiana and Virginia, provide "the mere grant of the right for autopsy and fix no penalty or condition in case the claimant refuses consent." The autopsy must be held in a reasonable time. It appears that no power is granted by the statutes of Indiana and Virginia to compel claimant to accept autopsy.

The best evidence should be had in all cases in order to safeguard the interest of all parties concerned. The modern trend of courts no doubt will be that the commission has the power to order that the employer as well as the claimant has the right to the benefit of the best evidence, the autopsy.

THE attitude of the injured may be revealed in another way, in effect more subtle and more far reaching in importance both to the injured and to the industrial surgeon. I refer to the subject of goitre which is of vital importance to the surgeon in this age. The occurrence of traumatic goitre deserves most careful and exact study. The case now to be cited illustrates a number of interesting features. A white single girl, aged 19 years, was first seen in the afternoon of the day of the accident and about one hour after injury. There were numerous superficial abrasions of the skin of the left leg; the injury being due to falling into an open water meter casing. The abrasions were treated and the wound healed promptly and without infections.

Examination revealed no physical or psychic shock. All organs were normal and no abnormality or deformity was noted. Some eight months later the party entered suit for damages alleging that "a goitre" had developed as a direct result of the injury sustained. Medical and surgical expert testimony was introduced in the case to show that the goitre had developed as a direct result and entirely on account of the said injury. The question to be determined was: "Did the claimant actually have a goitre; and, if so, was the trifling injury sustained in falling into the hole the sole and proximate cause of the goitre?" Thus, this case presented the debatable subject of traumatic goitre, a subject of vital importance to the industrial surgeon.

The subject cannot be adequately discussed or dealt with in the brief time at my disposal. However, I shall make a few observations in order to stimulate interest in the study of traumatic goitre; and I trust that I shall leave with you a proper understanding of the importance of the subject. At page 2223, Vol. 96, *J.A.M.A.* under the caption, "Surgery of Ophthalmic Goitre" you will find stated: "It is essential to distinguish the various degrees of hyperthyroidism. Hence, not only a surgical problem is involved, but also the cooperation of the internist and the neurologist is needed. Between the vegetative (nervous) system and the other known and unknown endocrine glands and cells there is a constant interaction. Hence, in exophthalmic goitre, while the thyroid may play the chief role, it is not the only gland involved, but it is only one of many. Classification of the types of the disease according to the anatomic observations or according to the basal metabolism falls wide of the mark. The cause must be inquired into; for that furnishes the chief explanation for the various types of hyperthyroidism. The most frequent mode of origin of exophthalmic goitre is a sudden psychic shock, a great misfortune or the like. Of 2,346 cases, some such cause could be discovered in 63%. Even a perfectly healthy man may, under the influence of some great event, develop exophthalmic goitre."

It seems clear, then, that the only type of goitre that may develop as a result of psychic trauma is the exophthalmic type. That physical injury may excite psychic shock is admitted. Hence, the possibility of exophthalmic goitre developing as a result of a physical trauma depends solely on the psychic reaction of the individual at the time of the injury. It is well known that a number of people may be profoundly affected by witnessing some harrowing experience. It is also known that the great majority of them will quickly reestablish normalcy and go on their way, unaffected and none the worse for the harrowing experience. It is likewise true that one or more out of the many witnessing the same harrowing experience may fail in adjustment and suffer psychic shock. The explanation of this rests on the individual's emotional response.

The presence of emotional instability in the individual lends itself to the unfolding of the manifestations of psychic shock. Hence, it may be truthfully said that emotional instability is a prerequisite for the development of exophthalmic goitre—certainly for that type that arises after injuries and is now designated as "traumatic goitre."

The experience of many careful clinicians teaches that exophthalmic goitre does not develop abruptly, that is, forthwith, but that its outgrowth occurs in cycles or waves. This statement seems sustained by the fact that in exophthalmic goitre the symptom complex is dependent upon a dysfunction or imbalance of the thyroid, thymus, parathyroid, adrenal, sex glands, possible the pancreas, and upon profound changes in the body nutrition. An easily understood summary of the whole subject of exophthalmic goitre is "It is the body that is sick and makes the neck sick." And in other types of toxic goitre—"It is the neck that is sick and makes the body sick."

The whole matter resolves itself into the following: A pre-existing state of the body poor in cellular resistance, unfavorable heredity, hurtfully influenced by glandular imbalance, and lacking in emotional stability. Such a patient subjected to psychic trauma will develop the fear, fright, "defense mechanism" which hurtfully affects the adrenal gland. A psychic trauma in some cases may be due to an actual physical trauma.

1. It is of great importance, therefore, that the history of the individual and the physical examination be carefully made, reviewed, recorded, and preserved for future use. It is an important duty of the surgeon to be assured of the true condition of the patient, as revealed by a searching physical examination.

2. It is not sufficient to treat even trivial injuries hastily and dismiss the case. Safety will only be had when we forsee the possible, or potential, developments of the case, and it is impossible to know this when only a cursory examination is made. The interest of all parties concerned will be safeguarded by an accurate

understanding by the surgeon of the case. The surgeon is chargeable with the added duty of anticipating untoward results and alleged claims of disability. Frequently a claimant will seek to magnify disability, or claim some disability which does not exist, and in such a case it may be difficult for the surgeon to prove the non-existence of such claims. The surgeon must engage in clear thinking, and think through the case. The one outstanding characteristic of the surgeon must be scientific honesty.

3. It is a good thing for the industrial surgeon to stop long enough for an impression to register in his mind. Nothing will ever be lost by such conservative action. It behooves us to know, at least, as much about our profession of surgery as many others claim to know.

NO. 54877: LENIEZ. On Traumatic Exophthalmic Goiter, *Progress med., Paris*, 31: 215-216 (November 20) 1916.

Case 1: The patient was an officer who fell from his horse striking on his head. He was kept in bed for a few days for concussion but soon went back to duty. Two months after the accident he returned for treatment for nervousness. Examination showed slightly staring eyes and a very manifest increase in size of the right lobe of the thyroid gland. There was a slight pulsation of the carotids and a pulse rate of 104. He had tremor of the fingers and had rapidly lost weight. The hypertropoid syndrome was very marked.

Case 2: In October, 1907, the author examined a patient who was on the way to recovery from exophthalmic goiter. This soldier came from a country where goiter was not endemic and had fallen on his head four years before he was called to service. He was unconscious for several days and was not able to work for three months. He had severe tachycardia and lost much weight. When he joined the army he had slight exophthalmus, a goiter on the right side and a pulse rate of 98. It seemed to be established that the goiter was due to the traumatism.

Case 3: The patient was a lieutenant, 33 years old who fell from his horse and landed on his head. He had a slight concussion which was not serious. A month later he had extreme weakness and lost weight rapidly. The right lobe of the thyroid gland increased in size and pulsations of the carotid appeared. He also had very slight exophthalmus, pulse rate of 110, tremor of the fingers, insomnia and marked nervousness. The syndrome of hyperthyroidism was complete. He was given hematoethyroidine which produce very remarkable results. He regained his lost weight and his pulse rate fell from 110 to 66. The other symptoms also disappeared.

No. 58093. VISCHER, MATTHEUS: A case of "Traumatic" Basedow's Disease with Fatal Issue, *Schweizerische medizinische Wochenschrift*, 56: 1102-1103 (November 13) 1926.

The author reports the case of a female patient 43 years old, in whom "traumatic" Basedow's disease appeared after an injury of the forehead by a falling tile. The patient died of cardiac weakness after pronounced psychosis. The physical predisposition was furnished by malformation of the suprarenal capsule and pronounced hyper plasia of the thymus, as seen at autopsy.

Those cases of Basedow's disease are called "traumatic" in which the onset of the affection in previously apparently healthy individuals is caused by a more or less violent psychic insult.

The author reports the case of a female patient, 43 years old, unmarried, in which consecutive to an injury of the head by a falling tile followed by a violent nervous shock, Basedow's disease appeared five weeks later and led to a fatal issue. According to reliable information, the disease had not been violent and dangerous from the very beginning. Another etiology, by iodine administration, for instance, could not be assumed. Examination showed a small colloid struma, which compressed even the trachea; the patient was, however, unaware of its existence so that, apparently, there was no call for treatment.

The patient had a small, strongly bleeding lacerated wound; she had not been unconscious after the accident, but after hurrying home, she became quite confused. She was very excited and could be quieted only gradually by remaining in bed. A marked swelling developed on the neck, and fever and palpitation of the heart appeared. The condition became so serious that the patient was compelled to stay in the hospital with diagnosis of "strumitis." The patient's neck and head were much inflamed and the veins dilated. The circumference of the neck was 41 cm. The swollen thyroid gland was not painful. Ice dressings caused decrease of the swelling after several days; there was a loud noise over the jugulum. Attacks of marked dyspnoea appeared several times, with tracheal rattling and marked cyanosis. After the attacks the respiration was free. A pronounced psychosis developed during the last days. The patient died from cardiac weakness four weeks after the accident. Autopsy confirmed the author's diagnosis: traumatic Basedow's disease.

According to recent assumptions regarding Basedow's disease, the thyroid gland is an organ the secretion of which increases the tonus of other parts of the visceral and cerebrospinal nervous system, its function is inhibited by nervous stimuli. In this way a vicious circle can easily appear. The thyroid gland plays the part of a "multiplicator"; this explains the often progressive character of the disease. It is dependent on the circumstances whether the nervous stimulus or the abnormal function of the thyroid gland is the primary factor. A constitutional basis can be frequently determined, but also in a "normal" individual a corresponding attack may be the cause for the outbreak of the disease. According to the findings, there may be thyrogenous, thymogenous and thyrothymogenous forms. The so-called "War Basedow" appeared in soldiers due to percussion after heavy firing or after other violent nervous shocks.

Many authors ascribe a different signification to the nervous attack. Oswald and Maranon believe that the psychic attack is often not the primary factor but the expression of an already existing liability of the nervous system. Gurney found mental emotions as releasing cause in 20% of his cases. Mackenzie found a more or less violent psychic attack in the anamnesia in one-third of his cases, after which disturbances appeared, usually immediately.

The Complete Occupational History

FOLLOWING the Silicosis Symposium held last June in connection with the Trudeau School of Tuberculosis at Saranac Lake, N. Y., B. E. Kuechle, Claims Manager, Employers Mutuals, Wausau, Wis., edited an unofficial transcript of the papers and proceedings. This he has made available in book form, under the title "Symposium on Silicosis." The subject matter of the following articles is presented in the 99 pages:

"Etiology of Silicosis," by Dr. R. R. Jones;

"Dust Concentrations and Methods of Measurement," by Donald E. Cummings;

"Pathology, Human and Experimental," by Dr. L. U. Gardner;

"Occupational History," by Donald E. Cummings;

"Clinical Aspects and Physical Findings," by Dr. Henry K. Kressler;

"Roentgenological Findings," by Dr. H. L. Sampson;

"Roentgeological Diagnosis," by Dr. H. K. Pancoast;

"Engineering Methods of Prevention," by Prof. Philip Drinker;

"Medical and Legislative Measures of Prevention," by Dr. A. J. Lanza;

"Fibrosis in Lung Disease," by Dr. Wm. S. McCann.

WITH respect to "Occupational History," Donald E. Cummings said "it is practically impossible to make an accurate diagnosis of silicosis or pneumonokoniosis without the assistance of an occupational history, and for this reason great care should be exercised in securing this record; every physician who is making an original chest examination on any individual should inquire into the patient's past experience in dusts, and if there has been any significant exposure the nature of the exposure should be carefully noted; routine physical examination of industrial groups should always include a written record of the employee's entire occupational history; the history should start with the worker's early life, ascertaining the period of schooling, and then the occupational record, and should show the length and nature of each occupation which the individual has engaged in during his or her working life; and the examiner should be able to determine whether a fairly complete description has been rendered, and if not, should be able to elicit the desired information by further questioning."

In order that exposures may be evaluated, Mr. Cummings urged that each employment record show the following:

1. Place (identifying name of the plant)
2. Occupation (type of employment, such as moulder, etc.)
3. Specific conditions under which work was performed (if a driller, whether drilling was in silicious rock, with wet or dry drills, etc.)
4. Length of exposure (hours per day, and total time expressed in half year periods).

He also suggested that a release should be signed by the employee, permitting the examiner to give information as to the employee's condition to the employer; that the person taking the occupational history should have an accurate knowledge of all the operations and occupations undertaken in the plant in which he is conducting his examinations, in order that he may note hazardous work stations which the employee fails to recognize or mention specifically; that the data secured should be checked wherever possible against company records to insure the greatest accuracy; that a family history and a record of habits and previous illnesses should be included in the occupational record; and that this part of the history should determine whether there have been or are at present any pulmonary infections in the immediate or preceding group of contacts, and this in turn should disclose the possibility of the employee having entered an industry with such an infection.

Mr. Cummings presented the following form, developed for *completeness* in occupational history data:

Study No. Date:
EXAMINATION FOR ..... COMPANY
Name Check No. Age Date of Birth
Address Study No. Nationality
Average Weight Greatest Weight One Year Ago
Family Record

	Living		Dead	
	Age	Health	Age at Death	Cause of Death
Father				
Mother				
Wife				
Children				
Other Contacts				

Has any one of your parents, brothers, sisters, wife or children ever had tuberculosis, epilepsy, insanity or heart disease? If so, give particulars.

Family Tendency:
Length of Life
Peculiarity of Stature
Weight
Birthplace:
School
Where: How Long:
Employment

Where:	Type of Work	Specific Conditions	How Long
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			

Marital Status: M. S. D. W. How Long
Habits of Living
Work Eating:
Water: Tobacco: Tea and Coffee:
Mental Attitudes: Drugs:
Past History
I. Longest period in bed With What When
II. Infections
A. Infectious diseases: Measles Scarlet Fever
Diphtheria Rheumatic Fever Chorea
Influenza Whooping Cough Pneumonia
Lues Typhoid Malaria
B. Local Infections:
III. Allergic Conditions: Hay Fever Asthma Eczema
IV. Injuries and Operations
A. What and when
By whom treated
How long disabled
Compensation
B. Ether:
V. Visceral Systems
A. Eyes: Eye strain Vision Glasses

B. Ears: Deafness Discharge Dizziness
C. Nose Obstruction Colds Catharrh Sinus
D. Throat: Sore Throat Tonsilitis
E. Teeth Pyorrhoea Devitalized Extracted
F. Cardio Respiratory: Dyspnoea Oedema Cough Palpitation Expectoration Haemoptysis Pain in Chest Bronchitis Night Sweats
G. Gastrointestinal: Appetite Distress after meals Nausea Vomiting Abdominal Pain Jaundice Constipation Diarrhoea Blood Piles
H. Urinary: Frequency Nocturia Blood Burning Stream Control Gonorrhoea Stone
I. Neuro Pyschriatric: Headaches Convulsions Paralysis Anxieties Insomnia Maladjustments Institutions

VI. Somatic System
A. Extremities: Stiffness Swelling Pain Varicosities
B. Spinal Column Back Strain Stiffness Pain
C. Rupture
D. Skin
VII. Vaccination and Serum Therapy
VIII. Ever Refused Insurance
IX. Recent X-Ray Exposure
X. Remarks

Present State of Health
A. How do you feel?
B. Have you lost any time on account of illness?
C. If so, whom did you report to?

I certify my answers to be true and request that the results of my examination be disclosed to the.....Co. by Dr.....

....
Witness Signature

Study No. Date:
Name:
Address:
General Appearance: Temp..... Pulse..... Resp.....
Height .....ft. .....inches
Weight.....lbs.
Hair: Estimated Wt.....lbs.
Skin: % Normal .....
Scars: Surface Area.....

Head
Eyes: lids Vision
balls Rt. at 13 inches
movements Lt. at 13 inches
pupils Rt. 20/
sclerae Distance
conjunctiva Lt. 20/
cornea Color:
Rt. Rt. Rt. /20
Ears: canal Drums Hearing
Lt. Lt. Lt. /20
Nose: M. M. Septum Turbinates
Rt. Rt.
Sinuses (a) Frontals (b) Maxillaries
Lt. Lt.
Lips:
Teeth: U. R. U.L.
8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8 O—Restored
8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8 X—Missing
L. R. L. L. =—Bad
Tongue:
Rt.
Throat: (a) tonsils (b) palate (c) pharynx
Lt.

Larynx

Glands: cervical Axillary inguinal epitrochlear
Thyroid: Signs of:
Palpable Hyperthroidism Hypothyroidsm
Eye signs
Diffuse enlargement Tremor
Tachycardia
Nodular Flushing

Chest:
HEART
Apex beat, Location
Rhythm
Sounds
Murmurs
Apex—systolic, diastolic, transmission
Base—pulmonic; systolic, diastolic, aortic; systolic, diastolic, transmission
Exercise At rest Exercise 2 minutes
Pulse
Respiration
Blood Pressure
Systolic Diastolic Pulse Pressure
Pulse regular Irregular
LUNGS
Expansion
Impaired resonance
Dullness Flatness
Voice Conduction
Prolonged expiration
Pectoriloquy
Broncho-Vesicular B.
Bronchial B.
Harsh inspiration
Feeble B. Amphoric B.
Rales—Fine, medium, coarse, moist
Sibilant, sonorous
Friction rub

Abdomen:
Hernia: Large
Umbilical Inguinal Rings
Small

Genitalia: Rectal
Scars Hemorrhoids
Discharge Sphincter
Scrotum Prostate
Testicles Vesicles

Extremities and Spine Spine Hands Feet Other Joints
Posture .....
Mobility .....
Swelling .....
Tenderness .....

Reflexes: K. Ks. Plantar Response Romberg
Circulation.
Varicose veins

Behavior:
General Gait
Speech Personality Type

Fluoroscope Rt. Lt.
Normal Breathing
Diaphragm: Excursion
Forced Breathing
Heart: A. P. Size Shape Position Aorta
Lateral Posterior Clear Zone Left Auricle Aorta
Superior Mediastinum

Laboratory Findings:
Red Blod Cells: Color Index:
Haemoglobin:
White Blood Cells:
Differential Remarks:
Polymorphonuclear
Lymphocytes:
Large
Small
Monocytes:
Eosinophiles:
Basophiles:
Others
Kahn Blood Sedimentation
or
Kline Guinea pig inoculation
Sputum
Urine
Specific Gravity Microscopic
Albumen Pus
Sugar Casts
r. b. c.

Special Procedures

Vital Capacity Exercise Tolerance

X-Ray Reading:
Milliampere Seconds Exposure:
Part rayed Distance With filter Without filter

Summary Diagnosis

Recommendations Rating

Examiner

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Occupational Diseases—Whose Problem?

THE prevailing interest in the occupational disease situation has pretty well served to emphasize the need for clarity of thought in regard to the qualifications of persons who may properly engage in the various aspects of the problems which occupational diseases present.

It is recognized at the outset that there are different ramifications involved in occupational diseases—for example:

The industrial environmental exposure which may produce disease, and the measurement of the hazard;

The medical supervision of the worker, which includes different pre-employment examination procedures, periodic re-examinations, clinical laboratory data, and proper selection and placement;

The diagnosis and treatment of occupational diseases; and finally, and most important of all,

The prevention of occupational diseases.

From this natural division of the subject it is clear that the character of the industrial environment and the measurement of possible exposure and hazard are definitely engineering procedures. But it must be equally obvious that the medical supervision, diagnosis and treatment belong in the province of the physician.

What is not really appreciated, however, as revealed by experience during the past 10 years, is the fact that a combination of the engineering phases and the medical phases is to be found in the work of the industrial hygienist.

It has been noted with increasing frequency, and also with considerable interest, that the various programs of safety organizations all over the country have lately been giving added attention and greater emphasis to occupational disease subjects*. This movement on the part of safety groups is not to be deplored but rather to be encouraged, for it can certainly be interpreted as foresight and the desire to be prepared for future developments.

But it is well in this connection to give serious thought to a situation out of which difficulties may eventually arise.

Within the realm of the safety engineer, as well as the safety inspector, it has become a habit to rely on visual inspection for the determination of possible accident hazards. This has worked very well, both on the part of safety groups and insurance organizations.

But it is not such a simple matter to apply this principle to ferreting out a potential occupational disease hazard—for the very obvious reason that while one may easily perceive visually a piece of unguarded moving machinery or other similar potential danger, one cannot estimate by visual inspection any such thing as the amount or quality of injurious dust which may be in the air—the amount of carbon monoxide, sulphur dioxide or other gas, or the amount of lead which may be present in the breathing environment of the industrial employee.

The safety engineer, however, can be of great assistance to the industrial physician by keeping himself reliably informed as to plant conditions and their possible bearing on occupational disease situations.

It is clearly within the province of the physician to determine what medical supervision should be carried out in any plant and, further, to be able to diagnose and treat occupational diseases.

Many physicians, however, have not appreciated that they should more definitely understand and interpret the conditions of the industrial environment as etiological factors in the production of occupational diseases.

Of course no one would assert that safety engineers should become diagnosticians or specialists in medical supervisory measures in industry.

It is believed, therefore, that the burden for the assumption of responsibility for the control of the etiological conditions producing occupational disease lies more with the physician than any other person concerned; that this portion of the problem has been much neglected is fully evident.

According to Bloomfield, Johnson, and Sayers,* a constructive program of industrial hygiene involves "a physician thoroughly trained in public health procedures and one having a comprehensive knowledge of the effects upon health of the various materials and processes used in industry; in other words, one trained in industrial hygiene." The program also involves "an engineer who is also trained in industrial hygiene and who is familiar with industrial processes. This person should know the following subjects from both the theoretical and practical viewpoint: (1) microscopy; (2) gas chemistry; (3) mechanics of ventilation; (4) physiology of ventilation; (5) industrial sanitation; (6) illumination; (7) industrial hygiene survey methods; and (8) occupational disease literature."

In addition to this type of personnel, the possession or availability of a completely equipped laboratory for carrying on industrial hygiene studies in industry is essential in such a program.

* For example, the "Occupational Disease" Programs of the Massachusetts and North Carolina Safety Conferences (see pp. 162 and 163).

* Bloomfield, J. J., Johnson, W. Scott, and Sayers, R.R., "Potential Problems of Industrial Hygiene in a Typical Industrial Area in the U. S." Public Health Bulletin No. 216, U. S. Treasury Dept., Public Health Service, December, 1934.

"A comprehensive knowledge of the effects upon health of the various materials and processes used in industry," certainly involves a practical and working knowledge of industrial toxicology.

The situation may be summed up in these words:

The properly-prepared and experienced physsician industrial hygienist combines a knowledge and practice of the evaluation of occupational disease hazards with the effects of such exposure upon the human body, the detection of abnormal physical conditions related to industrial exposure, and the principles of the prevention and control of occupational diseases. The physician industrial hygienist, therefore, is probably the one person who is capable of giving the best well-rounded service in this line of endeavor. Unfortunatelv few such individuals have been developed.

It may be concluded, therefore, that there is a vital necessity for the industrial physician to develop a greater interest in the potentialities of the industrial environment as related to occupational diseases. If he is incapable of scientifically measuring the hazard in the industrial environment (as in many cases he will be) he should at least become better informed as to the methods used and the interpretation of the results, and should actively associate himself with someone who can do this work.

Furthermore, without minimizing either the importance of medical supervisory measures or the diagnosis and treatment of occupational diseases, the necessity for industrial physicians to devote more time to the industrial environmental influences producing occupational diseases—in and by way of meetings, conferences, reports, and papers—has become a major issue.

Through these or similar efforts, the responsibility for the appreciation, evaluation, and control of industrial environment as the causal factor of occupational diseases, will be put where it belongs —in the hands of the qualified physician.

As excellent examples of this principle, the Office of Industrial Hygiene and Sanitation of the U. S. Public Health Service and the Bureau of Occupational Diseases, State Department of Health, Hartford, Conn., are cited—where the technical and administrative policies of the group are under the guidance and control of an experienced medical officer.

Anthraco-Silicosis

A PRELIMINARY report concerning a study made in the anthracite region of Pennsylvania by the U. S. Public Health Service* contains very interesting findings and material for consideration.

Later on it is planned to issue a more complete report in the form of a Public Health Service Bulletin.

The term anthraco-silicosis as used in this report is a descriptive title for the form of pneumoconiosis commonly called miners' asthma.

A study of health conditions regarding working environment, and including physical examinations of 2,711 men was made in three representative anthracite coal mines in Pennsylvania, forming the basis for this report.

* Anthraco-Silicosis. Special Bulletin No. 41. Commonwealth of Pennsylvania, Dept. of Labor & Industry, Harrisburg, Penna., 1934.

It is significant that the men examined were divided into occupational groups largely in accordance with the proportion of free silica found in the dust to which they were exposed. For the purpose of determining safe limits of dust exposure, of the data available, it appeared reasonable to assume that employment in an atmosphere containing less than 50 million dust particles per cubic foot, associated with a quartz content of less than 5% — such exposure was considered to be safe; a safe limit in the gangways where the dust contained about 13% free silica was set tentatively at 10 to 15 million particles per cubic foot of air; for rock workers where the quartz content was found to be about 35%, a safe limit appeared to be from five to 10 million dust particles per cubic foot of air.

The factor of age appeared to play only a minor role in the development of anthraco-silicosis, as revealed by this study.

Length of exposure or term of employment was found to be an interesting and important item. For instance, about 25% of all men employed underground developed anthraco-silicosis after a working period of more than 25 years (this group was exposed to dust having a quartz content of about 13%). Various values were found for the percentages of men developing disease, in which the time factor was definitely related to the concentration or amount of dust in the air.

Infection was also found to be an important consideration. For example, pulmonary infection increased with length of service more rapidly among the men in the haulageways than in the control group, and much more rapidly among the regular miners; the highest rate of pulmonary infection was found among the rock workers of more than 15 years' service. In the occurrence of infection, age was found to play a deciding role: prevalence of tuberculosis among the hard coal mining employees at ages below 35 was slightly less than that found through studies of tuberculosis among male adults in the general population of the country; in the age group of 35-44, the prevalence of tuberculosis was about twice—at age at 45-54, about five times—and for the ages above 55, it was about 10 times the rates found in the general population. As far as specific rates of tuberculosis are concerned, the highest prevalence of clinical tuberculosis occurred among rock workers who, after 20 years of service, showed the evidence of pulmonary tuberculosis to the extent of 37%; clinical tuberculosis was diagnosis in 15% of those with early anthraco-silicosis, and 43% of those in the more advanced stages.

From the results of this study it may be concluded (as has formerly been shown in previous studies) that the important etiological factors which determine the contraction of anthraco-silicosis are the concentration or amount of dust, the percentage of free silica in the dust, and the length of exposure or term of employment. In addition to these factors, age apparently plays an important etiological relationship in the contraction of pulmonary tuberculosis. This probably also has some relationship to the length of service.

Recommendations were made for lessening, and in many instances adequately controlling, the dust hazard by provision of proper ventilation; employment of wet methods in all mechanical drilling operations; thorough wetting of all coal and

rock before loading; substitution of mechanical loading for hand loading methods wherever practicable; allowing the lapse of a period of time sufficient to reduce dust concentration to a safe limit after firing charges; and the use of wet methods in processing coal.

Forms

WE HAVE been told that we should not publish forms, such as those used by Dr. Hayhurst in Ohio (p. 115), because they might "give lawyers ideas." The same criticism was made a year or so ago in connection with certain articles on the racketeering phases of the silicosis situation. And we said then, as we now say again, that lawyers as a rule get their own ideas, and an article or two, or a set of forms, will not add anything of importance to their mental armamentarium. Anyhow, what of it? The forms in this issue are reproduced for their possible use by, or suggestions to, the doctor.

Mr. Cummings' form (p. 141) has the merit of *completeness* in respect of the time and place that completeness in forms and records is most necessary, namely, at the time of *original* examination, and at the place, *inside* of industry, where the completest possible record that can be put on file is not complete enough if it omits to note discoverable conditions that later eventuate in an occupational disease.

Dr. Hayhurst's forms reflect the adaptations of experience in the matter of reporting certain occupational diseases—pneumokoniosis and lead poisoning—after they have occurred.

Letters

—Excepting the Petroleum Industry

I HAVE read with a great deal of interest Dr. Lautenschlager's story "Industry's 'Sacred Bull'", appearing in the January issue of *Industrial Medicine*. Apparently the Doctor has been associated with situations where companies have been more concerned in making accident records than in the actual prevention of industrial injuries. Unfortunately, Dr. Lautenschlager appears to have classed all safety engineers in this category.

The casual reader of the article might draw the conclusion that all industrial physicians share this same point of view as regards the industrial safety engineer. I am quite sure that I voice the sentiment of safety engineers and industrial physicians in the petroleum industry in suggesting to Dr. Lautenschlager that they should have been excepted in his article.

The definition of a disabling injury as used in the petroleum industry during recent years is as follows:

"A disabling injury is any injury arising out of and in the course of employment that results in death, permanent total disability, permanent partial disability, or temporary disability not confined to the day or shift on which the injury occurred. No matter at what time of day the employee is injured, if no permanent disability exists and if at the beginning of the next day he returns to a regularly established job which he can perform with normal efficiency, the injury shall not be counted as a disabling injury. However, if he returns after the beginning of the next day the injury is counted as a disabling injury, unless, in the opinion of a doctor, he was able to return to work at the beginning of that day but did not do so for some reason other than the injury. Exception: If an injured employee returns to work at the beginning of the next day following the one on which he was injured, but subsequently loses time because of the injury, it should be counted as a disabling injury."

The safety engineers even desire to make this definition stronger by requiring the injured man to return to his regular duties and perform them with normal efficiency if a disabling injury is not to be counted. In fact, companies do not have light duty jobs and do observe this practice anyway. The petroleum industry stands ready to adopt this definition whenever other industries will do so, so that their records may be comparable with the accident records of the petroleum industry.

I understand that the American Standards Association Safety Code Correlating Committee favors the adoption of the more stringent regulation.

I am quite well acquainted with the industrial medical men of many oil companies, and I find them wholeheartedly and sincerely working in the interest of employee care and protection. I know of no situation in which the safety engineer is in position to adversely influence the decision of the industrial physician and impair the interest of the worker. It is the policy of most companies, in any case of doubt, to send an injured workman to a hospital for observation.

Most certainly the oil industry is interested in actual accident prevention and the medical men and safety engineers have never been accused of working unharmoniously to this end. In years gone by a few safety engineers have tried to justify accident records in their companies by alleging that the companies with better records had not been entirely conscientious in the keeping of their records, but such a position taken by a safety engineer in the oil industry today would be most unpopular. Safety engineers, under such conditions now, are able to reply to the executives that had the executive interest been greater in the accident prevention program the accident record would have been better.

The petroleum industry has cause to be proud of its medical men who are real scientists in the field of medicine and have sufficient knowledge of the workings of the oil industry to make use of the knowledge of the operating executives and safety engineers in the disposition of injury cases.

—H. N. BLAKESLEE, American Petroleum Institute, Department of Accident Prevention.

[NOTE: Mr. Blakeslee's letter discusses an old problem. But it brings new light to a set of conditions which will continue to bother all who are concerned with the administration of industrial safety principles—unless an adequate, practical agreement can be reached through an extensive interchange of ideas. We therefore invite readers to submit ideas on this subject; contributions of this kind may ultimately be used in the form, or as the basis, of a round-table discussion, thus giving a resume of existing widespread opinion and experience.]

Industrial Medicine and Surgery

Development of Industrial Surgery

THIS article* concerns one phase of what the business of insurance has accomplished in the administration of what we may term its trusteeship under the provisions of the workmen's compensation law.

With the advent of this humane legislation, the business of insurance embarked practically upon an unknown sea with no more aids in navigating its craft than the "Ancient Mariner" had. But as the science of navigation grew to its present state of high perfection, where with the aid of a direction finder the craft may literally ride the radio beam, so we have learned in the experience which has grown out of the handling of this great problem, many things which in the beginning were a closed book.

"In the beginning" are the first three words in the Bible and they are good words to use in reviewing our experience in workmen's compensation. "In the beginning" and for many years thereafter, it was believed that the most important provision of the act is that the injured worker in industry shall promptly receive his compensation benefits.

In this early period, undue emphasis upon this provision created a tendency to overlook the fact that one of the reasons for the enactment of workmen's compensation legislation was the inadequacy of medical treatment furnished the injured man. Inadequate because society had not awakened to its great responsibility for healing the injured in industry. Inadequate because the medical profession had neither realized nor were equipped to assume their great place in the picture and because there was a general failure on the part of all to appreciate the importance of the quality of treatment to the future of the injured and the eventual cost to the employer. Medical arrangements at best, were arranged haphazardly. The great surgeons, and this is no reflection upon them, were not greatly interested in industrial injuries. Somehow or other, there was a feeling in the profession apparently that there was a stigma upon surgeons who did industrial work.

As we found that there was an appalling increase in the number of so-called permanent total cases, we as a business began to ask ourselves the question, if after all the prompt payment of compensation was the most important thing. Some of our leading surgeons recognized that the situation was an indictment either of the ability or the social consciousness of their profession. With this dawning consciousness on the part of the medical profession and the business of insurance, came also the idea that there could be such a thing as industrial surgery, a specialized treatment of those injured in industry. And still again, with the march of time, developed the so-called "end result" idea. Our business began to develop well thought out and definite programs for the surgical care of the industrially injured. A larger number of the ranking surgeons were enlisted, hospitals to a greater degree began to develop a technique for those who were so unfortunate as to be injured in their employment. More and more we were impressed with the need for skilled interference in serious cases. Clinics began to be held for the study of those cases which were found all too often in the classification of permanent totals.

The better care of fractures became the watchword of the American College of Surgeons because of the experience its members were having in industrial work. The study of the injured shoulder, many times lacking a true diagnosis, became the life work of one of Boston's eminent sons. The treatment of lead poisoning in industry was developed through the cooperation of one of Boston's leading physicians and our companies. But, we as a business, in cooperation with the medical profession, have not been content to confine our efforts to attempting to undo what has already been done. We have been equally active by research work to determine the cause and cure of such complications as infections, diseases, and similar developments of injuries in employment, and have correlated this activity with the other great undertaking of preventing the occurrence of the injury itself.

Space does not permit my going into the details of this work, but if you will pardon my referring to one case that has come to my attention recently, it will well illustrate what our business is attempting to do not only for the employee, but also for the employer. A manufacturer in this state received a much needed and long deferred order for a certain line of textiles, an order which meant employment for skilled employees. Soon after manufacturing operations began, the employees developed, from some unknown source, a serious skin disease on the hands. Every article used in connection with the process was suspected, but without results. Finally, the manufacturer had about decided that it was useless for him to attempt to fill the order, until the representatives of his insurance carrier, out of the fullness of their experience, were able to compare the situation at that particular plant with another a thousand miles away and to determine definitely the cause of the infection.

At the beginning of this article, I called attention to the fact that "in the beginning" the payment of compensation was considered the first essential. I think today, we as a business, have concluded that a more important thing is to render prompt and efficient medical and surgical service to the injured workman to the end that there may be a satisfactory "end result," a reduction in loss of wages suffered by the workman and a reduction in the cost to industry.

* Charles E. Hodges, President, American Mutual Liability Insurance Company, in *Journal of American Insurance*, March, 1935.

Value of the Fluoroscope in Pulmonary Tuberculosis Case Finding

IN the early part of 1927* we in the Medical Division at the Home Office of the Metropolitan Life Insurance Company were trying to find a solution to a tuberculosis problem which had been causing concern for a long time. Employees would occasionally report to the dispensary complaining of typical symptoms of tuberculosis, although a satisfactory physical examination of the chest had been made a short time before. This happened in spite of the fact that our examining staff was made up of competent physicians, each one connected with a hospital, clinic, or teaching institution, and some of them particularly trained in the diagnosis of diseases of the lungs. To complicate matters still more, we were seeing employees whose roentgenograms showed a lesion typical of pulmonary tuberculosis who had neither symptoms nor physical signs of pulmonary disease. With this evidence, we realized that even relatively large pulmonary lesions might not produce detectable signs or give any symptoms whatsoever.

Incidentally, this was not as well known then as now.

We believed that for purposes of accurate diagnosis a routine x-ray examination of the chest would be ideal, but the technical problem of making the requisite 17,000 or more roentgenograms yearly was great and the question of expense was not ignored. Our problem was to find an accurate, rapid, economical way of selecting the proper cases for further x-ray study. It was decided to try fluoroscopy on a series of cases with the hope that this method of examination would fulfil the requirements. Consequently, in October, 1927, 100 individuals were examined physically, fluoroscopically and roentgenographically, and the results justified further trial.

In the first seven months of this experiment 3,300 applicants for employment were examined, the examination consisting of the usual medical and personal history and physical and fluoroscopic examination. In this group we found 37 individuals whom we would have accepted after the physical examination, but who, after a fluoroscopic examination, were classified as "abnormal chests," and then after x-ray examination were classified as having a lesion typical of pulmonary tuberculosis. We were convinced that we were on the right track and since that time have adhered to this method.

Our problem now divided itself naturally into two parts, the detection of pulmonary tuberculosis—(1) among applicants for employment

* By Haynes Harold Fellows, M.D., Assistant Medical Director, Metropolitan Life Insurance Company—Read before the Child Hygiene Section of the American Public Health Association at the Sixty-third Annual Meeting in Pasadena, Calif., September 6, 1934; published in *American Journal of Public Health*, February, 1935.

and (2) among our Home Office employees.

From January, 1928, through December, 1933, 17,765 applicants for employment were examined, of whom about 95% were girls and 5% boys. The average age in this group was about 18 years. Among these applicants there were 244 persons whose roentgenograms showed a lesion typical of pulmonary tuberculosis (see Table 1).

Year	Number of Applicants	Cases of Pulmonary Tuberculosis and Method of Detection					
		Total		Suggestive History	Suggestive Physical Signs	Fluoroscopy Only	
		Number	Rate per 1,000 Applicants			Number	Per Cent of Total
1928-33	17,765	244	13.7	25	19	200	82
1928	4,405	69	15.7	9	7	53	77
1929	4,780	57	11.9	6	6	45	79
1930	3,105	36	11.6	3	1	32	89
1931	2,175	33	15.2	2	4	27	82
1932	2,134	32	15.0	2	0	30	94
1933	1,166	17	14.6	3	1	13	76

TABLE 1
Incidence of Pulmonary Tuberculosis and Method of Detection among Applicants for Employment
Home Office, Metropolitan Life Insurance Company
1928-1933

Year	Number of Employees	Cases of Tuberculosis Diagnosed	Rate per 1,000 Employees
1928	11,530	106	9.2
1929	11,966	85	7.1
1930	12,468	71	5.7
1931	13,081	72	5.5
1932	13,582	59	4.3
1933	13,960	42	3.0

TABLE 2
Cases of Pulmonary Tuberculosis (Active, Activity Questionable, Apparently Healed) Detected among Employees of the Home Office, Metropolitan Life Insurance Company
1928-1933

Year	Total		Suggestive History or Physical Signs	Fluoroscopy	Others (Routine X-ray Retake, etc.)
	Cases	Rate per 1,000 Employees			
1929	33	2.8	18	15	0
1930	29	2.3	17	12	0
1931	29	2.2	22	5	2
1932	33	2.4	20	8	5
1933	20	1.4	6	13	1

TABLE 3
Cases of Active Pulmonary Tuberculosis and Method of Detection Among Employees of the Home Office, Metropolitan Life Insurance Company

Because of the personal and public health aspects involved, we did not feel that our interest or responsibility ended with a refusal to employ these people. Consequently, we reexamined, advised, and did all we could to help in the proper disposition of these cases. During the first year we also secured additional and subsequent information upon many of these applicants rejected because of chest lesions. We were able to follow closely 42 cases; the remaining 27 cases dropped from sight in spite of all efforts. The results were enlightening. Within the year we found by x-ray that 21, exactly one-half of the cases followed, had either a spread, or were complaining of symptoms denoting activity, or were developing abnormal physical signs, or already had been admitted to a sanatorium or hospital for treatment. Since starting this work we have been able to re-examine and advise 75% of the applicants rejected because of the presence of pulmonary tuberculosis, most of whom were in need of immediate treatment.

The findings among Home Office employees are given in Tables 2 and 3. Table 2 shows the decreasing number of new cases of tuberculosis detected yearly. The decrease is due largely to the detection and classification in 1928 and 1929 of the healed cases among the older employees, and also to the fact that we are not now employing persons with demonstrable tuberculous lesions. Table 3 shows decrease by years in the number of cases needing treatment.

The results can be summarized by saying that we believe that we are not now employing persons with pulmonary tuberculosis and we are everlastingly alert to detect this disease in our Home Office employees at the earliest stage.

And, curiously, our endeavors have brought us face to face with another phase of the problem which is now causing some perplexity. For years we have been encountering individuals whose chest roentgenograms show evidence of a typical tuberculous lesion, who are asymptomatic and demonstrate no abnormal physical signs. Among the company employees we have advised and urged the younger ones and those whose lesions are shown to be unstable by x-ray examination to take treatment at the company sanatorium at Mt. McGregor, and have allowed the others to work under very close observation. So far, we believe we have made no mistake. An analysis of 141 cases diagnosed as tuberculous subsequent to a negative x-ray or negative fluoroscopic examination shows that significant pulmonary tuberculosis may develop in the late adolescent and adult, that it is possible to detect many of these cases at a stage before physical signs or symptoms can be elicited, that some of these cases follow an unsatisfactory course while others are cured without untoward incident at our sanatorium. It is not possible to foretell which case will react favorably and which unfavorably, so we believe that the safest method is to advise the younger members of such a group to take sanatorium treatment under favorable circumstances, and to keep the older individuals under close medical observation.

After seven years' experience with our present routine of chest examination, we believe that we have made real progress in handling our pulmonary tuberculosis problem. Realizing that a physical examination, no matter how painstakingly done, does not reveal abnormal signs in a large number of tuberculous cases, we have met this shortcoming by adding a routine fluoroscopic examination and a roentgenographic examination of cases selected by this method for further study. From the administrative standpoint, this method is rapid and economical; as checked by x-ray examination, it is accurate.

METROPOLITAN* does its best to inject humanity and sociability into the company life. Every day the company gives all its clerks a free lunch. The four great lunch rooms in the two buildings serve 2,500,000 lunches a year, which is more than the annual luncheon service of the three biggest Schrafft restaurants in New York. The Metropolitan lunch is 40 minutes long. Probably the company saves time by giving it; and it is better to have the clerks eat a healthy menu than to have them dozing all afternoon after a lunch of hot dogs and beer, or getting indigestion from chocolate-fudge sundaes and marshmallow and pecans. The company also offers free

* *Fortune*, August, 1934.

umbrellas when it rains, free teeth-cleaning, free medical service, free gymnasiums, low-cost insurance, a cooperative store where the employee can buy anything from baby pants to baseball bats at slightly above cost. If the employee is very sick the Metropolitan will take him for free treatment to its Mt. McGregor Sanatorium, nine miles north of Saratoga, New York. Last year this up-to-date institution, which stands on 1,300 acres of high, dry ground, treated 595 sufferers from tuberculosis, nervous breakdown, anaemia, etc., and cost the company $435,000 for maintenance. But Metropolitan employees show a slightly lower death rate than workers in the companies that the Metropolitan Group insures (such as General Motors and Southern Pacific).

Silicosis at Common Law

PROCEDURE* under the common law is not well adapted to the determination of liability for silicosis. In a common law action, it is necessary to establish three things:

(a) Has the plaintiff contracted silicosis? This is almost purely a medical question.

(b) If the plaintiff has contracted silicosis, did he contract it because of conditions in the defendant's plant? This is partly a medical and partly a non-medical question. Whether the conditions, having been once determined, were such that they probably caused the silicosis, is a medical question.

(c) The remaining point to be proved by the plaintiff in a common law action is whether the defendant was negligent in permitting the conditions which caused the injury to the plaintiff by silicosis. This question is a question of ordinary law and fact. It involves practically no medical questions.

"The employee's remedy by common law action is slow and difficult. Such cases have to wait their turn on the court calendars and when they are reached, the trial frequently consumes from two to four weeks. The greater part of the time is consumed in the consideration of medical questions. The determination of these questions is left to a jury; the jury has no training in medical matters except that which it acquires during the trial of the case. The common law procedure is extremely expensive, both to the employee and the employer. It is uncertain of arriving at a just result and it is not satisfactory to either party.

"Merely to put silicosis under the Workmen's Compensation Act will not give the employee a quick and sure remedy at a reasonable cost to the employee, nor will such procedure bring within reasonable bounds the expenditures of the employer. It is true that the inclusion of silicosis in the Workmen's Compensation Act would remove from consideration the determination of the questions of negligence. It would not, however, remove the question as to where and in whose employ the workman inhaled the injurious dust. Nor would it in anywise solve the medical questions of diagnosis and prognosis.

"Industrial diseases of slow development and progress, and industrial accidents, are two very different things, and should be handled in a different manner. In a large percentage of accident cases there is no question but what the employee has suffered an injury by accident. In a large percentage of claims for silicosis, there is the primary question as to whether the employee is suffering from that disease. In a larger percentage of cases of accident there is no question as to whether the plaintiff suffered the accident in the defendant's plant. In a large percentage of silicosis, it is a question very difficult of determination whether the injury by silica arose out of employment in the defendant's plant or in some previous employment, or entirely outside of employment. Medical questions regarding silicosis are by far more frequent and difficult than in accident cases. Whatever the situation may be in regard to accidents, a medical board is a necessity, if there is to be prevention, control and compensation for silicosis."

* From an address by Frederick Snow Kellogg, before the Insurance Section of the American Bar Association, 1934.

Carbon Tetrachloride Poisoning

THE uses of carbon tetrachloride are: (1) removal of grease from metal parts; (2) removal of grease in dry-cleaning; (3) in technology for the extraction of facts; (4) as a solvent for crude rubber; (5) in the vulcanization of caoutchouc; (6) as a solvent for lac, resin, etc.; (7) in some forms of fire-extinguishers; and (8) as an anthelmintic drug.

According to Moller*, the dangers of carbon tetrachloride to man are: (1) the employment of carbon tetrachloride in fire extinguishers; (2) intoxication after intake of carbon tetrachloride for anthelmintic purposes; (3) intoxication after inhalation of fumes of carbon tetrachloride; (4) intoxication in connection with dry shampoos; and (5) intoxication from inhalation of carbon tetrachloride in other uses of the substance.

In summary, carbon tetrachloride is a poisonous substance, of the same narcotic potency as chloroform but somewhat more toxic. Like chloroform and unlike benzine it is non-inflammable. If the public is instructed about the toxicity of carbon tetrachloride and especially about the great heaviness of the fumes, then it is reasonable to assume that the use of this substance for dry-cleaning and similar purposes involves less danger to life and health than benzine. But in the future containers in which the substance is distributed ought to be labelled conspicuously with a statement of the poisonous properties of the substance, and the public warned as emphatically as possible that the substance must not be used in closed or poorly ventilated rooms, and that preferably it should only be used in the open air.

Under no circumstances is carbon tetrachloride to be used for shampoo. Its use in public hair dressing parlors and similar places should be prohibited if possible.

* Moller, Knud. O., *Journ. Ind. Hyg.*, November, 1933.

Benzine, Toluol and Xylol*

SHORTLY after benzol came into common use it was found to be poisonous, causing an anemia from which recovery was slow, and in some cases, impossible. Manufacturers, on being approached as to the necessity of either getting rid of benzol or ventilating the rooms in which it was used, claimed either that it was not as dangerous as represented or that no ventilation scheme was necessary for getting rid of the fumes. Some said, "This interference with our business will ruin us."

Things have changed somewhat since those days. Those who use benzol now are satisfied as to the danger. They agree that the proper sort of ventilation will prevent the accumulation of fumes in the factory working spaces and thereby allow the workers to continue without injury to their health.

Fortunately, some other preventive measures have been found. Although benzol is a first class solvent, a substitute can easily be used, perhaps less quick in action, but certainly less dangerous. If the amount of benzol used in the course of the day is halved, the dangers are halved. Let caution be observed, however, in providing a substitute. Some hopeful manufactures reasoned that, although benzol was known to be dangerous, toluol and xylol were not known to be dangerous; therefore, it was safe to use the latter two as substitutes. This reasoning was wrong. It ought to be apparent that if one chemical substance is similar to another known to be poisonous, the first is probably poisonous, too; and this is exactly what is now being proved true. Toluol and xylol, very close in chemical composition to benzol, are much like it in their effects upon the human system. They, in their turn, require substitution or ventilation. The great principle upon which the prevention of occupational poisons is founded is merely the dilution of the poisonous gas which workers breathe. Petroleum naphtha is now being used as a satisfactory substitute.

As far as use is concerned, there is little to choose between the three chemicals: benzol, toluol and xylol. Therefore, some other substitute or diluent will have to be selected if poisoning is to be avoided without ventilation. Nearly all solvents are unpleasant, if not dangerous, to breathe. Their volatility is the characteristic which needs ventilation.

The State Department of Labor administers the Workmen's Compensation Act which requires that compensation will be granted to people poisoned by benzol. It also provides laws and regulations for making the factory workshop safe and, further, while it demands that the employer shall provide ventilation, it also supplies the means whereby every employer interested in factory hygiene can obtain information as to what system of ventilation is the best and how it may be constructed. Every employer is obliged to supply to the State Department of Labor plans in triplicate of whatever projected system is to be used.

* Editorial, *The Industrial Bulletin*, Albany, N.Y., February, 1935.

Occupational Diseases

North Carolina's New Law

NORTH CAROLINA'S new occupational disease law, ratified March 26, 1935, was drafted after conferences between employees and employers. At the initial meetings there were between 40 and 50 employer representatives present, as well as representatives from the home offices of several insurance companies and the State Insurance Commissioner. The President of the State Federation of Labor participated in the various conferences. A committee was appointed to work out the details of the bill; a subcommittee of this committee did most of the work. The joint insurance legislative committee approved the bill as written. However, there was still a small group of employers who offered some objections to certain features of it. These were ironed out, by amendments; these amendments were agreed to by the representative of labor; the bill passed the House of Representatives unanimously. When the bill got to the Senate another employer felt that certain minor changes should be made. Two rather insignificant amendments were adopted in the Senate, and again there was no dissenting vote against the bill, though there was some discussion.

The conferences agreeing upon the occupational disease bill were in keeping with the method used in the passage of the State's Compensation law in 1929. It was passed as an agreed bill between employers and employees.

A few outstanding features of the bill:

First, this is probably one of the first laws in the country to provide for physical examinations of prospective employees as well as periodical examinations of those now engaged in the two principal dust industries, asbestos and silica.

Second, this law provides for the removal of employees found in the very early stages.

Third, as a part of the removal program there is a provision for vocational education (the first and only such bill to provide for vocational training).

Fourth, there is provision for a medical set-up.

CHAPTER 120, Public Laws of 1929, amended by inserting after Sec. 50 and before Sec. 51 a new section to be known as Sec. 50½ as follows:

"Sec. 50½. (a) The disablement or death of an employee resulting from an occupational disease described in paragraph (b) of this section shall be treated as the happening of an injury by accident within the meaning of the North Carolina Workmen's Compensation Act and the procedure and practice and compensation and other benefits provided by said act shall apply in all such cases except as hereinafter otherwise provided. The word 'accident,' as used in the Workmen's Compensation Act, shall not be construed to mean a series of events in employment, of a similar or like nature, occurring regularly, continuously or at frequent intervals in the course of such employment, over extended periods of time, whether such events may or may not be attributable to fault of the employer, and disease attributable to such causes shall be compensable only if culminating in an occupational disease mentioned in and compensable under this act. Provided, however no compensation shall be payable for asbestosis and/or silicosis as hereinafter defined if the employee, at the time of entering into the employment of the employer by whom compensation would otherwise be payable, falsely represented himself in writing as not having previously been disabled or laid off because of asbestosis or silicosis.

(b) The following diseases and conditions only shall be deemed to be occupational diseases within the meaning of this act:

1. Anthrax.
2. Arsenic poisoning.
3. Brass poisoning.
4. Zinc poisoning.
5. Manganese poisoning.
6. Lead poisoning. Provided the employee shall have been exposed to the hazard of lead poisoning for at least 30 days in the preceding 12 months' period, and provided further only the employer in whose employment such employee was last injuriously exposed shall be liable.
7. Mercury poisoning.
8. Phosphorus poisoning.
9. Poisoning by carbon bisulphide, methanol, naphtha, or volatile halogenated hydrocarbons.
10. Chrome ulceration.
11. Compressed-air illness.
12. Poisoning by benzol, or by nitro and amido derivatives of benzol (dinitrol-benzol, anilin, and others).
13. Infection or inflammation of the skin or eyes or other external contact surfaces or oral or nasal cavities due to irritating oils, cutting compounds, chemical dust, liquids, fumes, gases or vapors.
14. Epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye due to tar, pitch, bitumen, mineral oil, or paraffin, or any compound, product, or residue of any of these substances.
15. Radium poisoning or injury by x-rays.
16. Blisters due to use of tools or appliances in the employment.
17. Bursitis, of the knee or elbow, due to intermittent pressure in the employment.
18. Miner's nystagmus.
19. Bone felon due to constant or intermittent pressure in employment.
20. Synovitis, caused by trauma in employment.
21. Tenesynovitis, caused by trauma in employment.
22. Carbon monoxide poisoning.
23. Poisoning by sulphuric, hydrochloric or hydrofluoric acid.
24. Asbestosis.
25. Silicosis.

Occupational diseases caused by chemicals shall be deemed to be due to exposure of an employee to the chemicals herein mentioned only when as a part of the employment such employee is exposed to such chemicals in such form and quantity, and used with such frequency as to cause the occupational disease mentioned in connection with such chemical.

(c) The term 'disablement' as used in this section as applied to cases of asbestosis and silicosis means the event of becoming actually incapacitated, because of such occupational disease, from performing normal labor in the last occupation in which remuneratively employed; but in all other cases of occupational disease shall be equivalent to 'disability' as defined in Sec. 2, Par. (1) of the North Carolina Workmen's Compensation Act.

(d) The term 'disability' means the state of being incapacitated as the term is used in defining 'disablement' in paragraph (c) hereof.

(e) The provisions of this act shall apply only to cases of occupational disease in which the last exposure in an occupation subject to the hazards of such disease occurred on or after the date on which this section shall have taken effect.

(f) In any case where compensation is payable for an occupational disease, the employer in whose employment the employee was last injuriously exposed to the hazards of such disease, and the insurance carrier, if any, which was on the risk when the employee was so last exposed under such employer, shall be liable.

(g) An employer shall not be liable for any compensation for asbestosis, silicosis or lead poisoning unless disablement or death results within three years after the last exposure to such disease, or, in case of death, unless death follows continuous disability from such disease, commencing within the period of three years limited herein, and for which compensation has been paid or awarded or timely claim made as hereinafter provided and results within seven years after such last exposure. Claims for all other occupational diseases shall be barred unless claims shall be filed with the Industrial Commission within one year from the disablement or death caused by such occupational disease.

(h) In the event of disability from an occupational disease, the employer shall provide reasonable medical and/or other treatment for such time as in the judgment of the Industrial Commission will tend to lessen the period of disability or provide needed relief; provided, however, medical and/or other treatment for asbestosis and/or silicosis shall not exceed a period of three years nor cost in excess of $334 in any one year; and, provided further, all such treatment shall be first authorized by the Industrial Commission after consulting with the Advisory Medical Committee.

(i) The compulsory examination of employees and prospective employees as herein provided applies only to persons engaged or about to engage in an occupation which has been found by the Industrial Commission to expose them to the hazards of asbestosis and/or silicosis. The Industrial Commission shall designate by order each industry found subject to any such hazard and shall notify the employers therein before such examinations are required. On and after the date on which this act becomes operative it shall be the duty of every

employer in the conduct of whose business his employees or any of them are subjected to the hazards of asbestosis and/or silicosis, to provide prior to employment necessary examinations of all new employees for the purpose of ascertaining if any of them are in any degree affected by asbestosis and/or silicosis or peculiarly susceptible thereto; and every such employer shall from time to time, as ordered by the Industrial Commission, provide similar examinations for all of his employees whose employment exposes them to the hazards of asbestosis and/or silicosis. At least one member of the Advisory Medical Committee or other physician designated by the Industrial Commission shall make such examinations or be present when any such examination is made. The refusal of an employee to submit to any such examination shall bar such employee from compensation or other benefits provided by this act in the event of disablement and/or death resulting from an exposure to the hazards of asbestosis and/or silicosis subsequent to such refusal. It shall be the duty of the Industrial Commission to make and/-or order such inspections of employments and to keep a record of all employments subjecting employees to the hazards of asbestosis and/or silicosis, and to notify the employer in any case where such hazard shall have been found to exist. The unreasonable failure of an employer to provide for any examination or his unreasonable refusal to permit any inspection herein authorized shall constitute a misdemeanor and shall be punishable as such.

(j) Where an employee, though not actually disabled, is found by the Industrial Commission to be affected by asbestosis and/or silicosis, and it is also found by the Industrial Commission that such employee would be benefited by being taken out of his employment and that such disease with such employee has progressed to such a degree as to make it hazardous for him to continue in his employment and is in consequence removed therefrom by order of the Industrial Commission, he shall be paid compensation as for temporary total or partial disability, as the case may be, until he can obtain employment in some other occupation in which there are no hazards of such occupational disease; provided, however, compensation in no such case shall be paid for a longer period than 20 weeks to an employee without dependents, nor for a longer period than 40 weeks to an employee with dependents, and in either case said period shall begin from the date of removal from the employment, unless actual disablement from such disease results later and within the time limited in paragraph (g) of this section. When in any such case the forced change of occupation shall in the opinion of the Industrial Commission require that the employee be given special training in order to properly readjust himself there shall be paid for such training and incidental traveling and living expenses an additional sum which shall not exceed $300 in the case of an employee without dependents, and which shall not exceed $500 in the case of an employee with dependents, such payment to be made for the benefit of the employee to such person or persons as the Industrial Commission may direct; provided, however, no such payment shall be made unless the employee accepts the special training herein provided, nor shall payment be made for a longer period of time than the employee shall accept such special training. If an employee has been so compensated, and whether or not specially trained for another occupation, and he thereafter engages in any occupation which exposes him to hazards of silicosis and/or asbestosis without first having obtained the written approval of the Industrial Commission, neither he, his dependents, personal representative nor any other person shall be entitled to any compensation for disablement or death from silicosis and/or asbestosis: provided, however, that an employee so affected. as an alternative to forced change of occupation, may, subject to the approval of the Industrial Commission, waive in writing his right to compensation for any aggravation of his condition that may result from his continuing in his hazardous occupation; but in the event of total disablement and/or death as a result of asbestosis and/or silicosis with which the employee was so affected compensation shall nevertheless be payable, but in no case, whether for disability or death or both, for a longer period than 100 weeks. Such written waiver must be filed with the Industrial Commission, and the Commission shall keep a record of each waiver, which record shall be open to the inspection of any interested person.

(k) The word 'silicosis' shall mean the characteristic fibrotic condition of the lungs caused by the inhalation of dust of silica or silicates. 'Asbestosis' shall mean a characteristic fibrotic condition of the lungs caused by the inhalation of asbestos dust.

(1) Compensation shall not be payable for disability or death due to silicosis and/or asbestosis unless the employee shall have been exposed to the inhalation of dust of silica or siilcates or asbestos dust in employment for a period of not less than two years in this state, provided no part of such period of two years shall have been more than 10 years prior to the last exposure.

(m) Except as herein otherwise provided, in case of disablement or death from silicosis and/or asbestosis, compensation shall be payable in accordance with the provisions of the North Carolina Workmen's Compensation Act.

(n) In case of disablement or death due primarily from silicosis and/or asbestosis and complicated with tuberulosis of the lungs compensation shall be payable as hereinbefore provided, except that the rate of payments may be reduced one-sixth.

(o) Unless written notice of the first distinct manifestation of an occupational disease shall be given to the employer in whose employment the employee was last injuriouslv exposed to the hazards of such disease or to the Industrial Commission within 30 days after such manifestation, and, in case of death, unless also written notice of such death shall be given by the beneficiary hereunder to the employer or the Industrial Commission within 90 days after occurrence, and unless claim for disability and/or death shall be made within one year after the disablement or death, respectively, all rights to compensation for disability or death from an occupational disease shall be forever barred; provided, however, that notice and/or claim shall be deemed waived in case of disability or death where the employer or insurance carrier voluntarily makes compensation payments therefor, or, within the time above limited, has actual knowledge of the incurrence of the disease or of the death and its cause, or by his or its conduct misleads the injured employee or claimant reasonably to believe that notice and/or claim has or have been waived; and provided further that where compensation payments have been made and discontinued, and further compensation is claimed, whether for disability or death from asbestosis, silicosis or lead poisoning, the claim for such further compensation shall be made within two years after the last payment, but in all other cases of occupational disease claim for further compensation shall be made within one year after the last payment.

(p) Upon the filing of a claim for death from an occupational disease where in the opinion of the Industrial Commission a postmortem examination is necessary to accurately ascertain the cause of death, such examination shall be ordered by the Industrial Commission. A full report of such examination shall be certified to the Industrial Commission. The surviving spouse or next of kin and the employer or his insurance carrier, if their identity and whereabouts can be reasonably ascertained, shall be given reasonable notice of the time and place of such postmortem examination, and, if present at such examination, shall be given an opportunity to witness the same. Any such person may be present at and witness such examination either in person or through a duly authorized representative. If such examination is not consented to by the surviving husband or wife or next of kin, all right to compensation shall cease.

(q) If on the hearing of a claim for compensation for asbestosis and/or silicosis, any controverted medical question or questions shall arise, the Industrial Commission shall reserve its decision and award until it shall have received a report from the Advisory Medical Committee; and the Industrial Commission may in its discretion refer to said committee controverted medical questions arising out of other occupational disease claims.

(r) The Advisory Medical Committee, upon reference to it of a case of occupational disease, shall notify the employee, or, in case he is dead, his dependents or personal representative, and his employer to appear before the Advisory Medical Committee at a time and place stated in the notice. If the employee be living, he shall appear before the Advisory Medical Committee at the time and place specified then or thereafter and he shall submit to such examinations including clinical and x-ray examinations as the Advisory Medical Committee may require. The employee, or, if he be dead, the claimant and the employer shall be entitled to have present at all such examinations a physician admitted to practice medi-

cine in this state who shall be given every reasonable facility for observing every such examination whose services shall be paid for by the claimant or by the employer who engaged his services. If a physician admitted to practice medicine in the state shall certify that the employee is physically unable to appear at the time and place designated by the Advisory Medical Committee, such committee, may upon the advice of the Industrial Commission, and on notice to the employer, change the place and/or time of the examination so as to reasonably facilitate the examination of the employee, and in any such case the employer shall furnish transportation and provide for other reasonably necessary expenses incidental to necessary travel. The claimant and the employer shall produce to the Advisory Medical Committee all reports of medical and x-ray examinations which may be in their respective possession or control showing the past or present condition of the employee to assist the Advisory Medical Committee in reaching its conclusions.

(s) The Advisory Medical Committee shall, as soon as practicable after it has completed its consideration of a case, report to the Industrial Commission its opinion regarding all medical questions involved in the case. The Advisory Medical Committee shall include in its report a statement of what, if any, physician or physicians were present at the examination on behalf of the claimant or employer and what, if any, medical reports and x-rays were produced by or on behalf of the claimant or employer.

(t) The Advisory Medical Committee shall file its report in triplicate with the Industrial Commission, which shall send one copy thereof to the claimant and one copy to the employer by registered mail. Unless within 30 days from receipt of the copy of said report the claimant and/or employer shall request the Industrial Commission in writing to set the case for further hearing for the purpose of examining and/or cross examining the members of the Advisory Medical Committee respecting the report of said committee, said report shall become a part of the record of the case and shall be accepted by the Industrial Commission as expert medical testimony to be considered as such and in connection with all the evidence in the case in arriving at its decision.

(u) There shall be an Advisory Medical Committee consisting of three members, who shall be licensed physicians in good professional standing and peculiarly qualified in the diagnosis and/or treatment of occupational diseases. They shall be appointed by the Industrial Commission with the approval of the governor, and one of them shall be designated as chairman of the committee by the Industrial Commission. The members of the committee shall be appointed to serve terms as follows. One for a term of two years, one for a term of four years, and one for a term of six years. Upon the expiration of each term as above mentioned the Industrial Commission shall appoint a successor for a term of six years; except that the terms of the members first appointed shall expire June 30, 1936. The function of the committee shall be to conduct examinations and make reports as required by paragraphs (q), (r), (s) and (t) of this section, and to assist in any postmortem examinations provided for in paragraph (p) of this section when so directed by the Industrial Commission. Members of the committee shall devote to the duties of the office as much of their time as may be required in the conducting of examinations with reasonable promptness, and they shall attend hearings as scheduled by the Industrial Commission when their attendance is desired for the purpose of examining and cross examining them respecting any report or reports made by them.

The members of the Advisory Medical Committee shall be paid such salaries and/or fees and expenses, and in monthly instalments or in such other manner as may be determined by the governor and approved by the Advisory Budget Commission.

The Industrial Commission shall establish a schedule of reasonable charges to defray the expenses incurred in making examinations pursuant to paragraphs (i) and (p) of this section, such charges to be collected in accordance with rules and regulations which shall be adopted by the Industrial Commission. Said charges shall be collected from employers who by order of the Industrial Commission are determined to be subject to the hazards of asbetosis and/or silicosis.

In hearings arising out of claims for disability and/or death resulting from occupational diseases the Industrial Commission shall tax as a part of the costs in cases in which compensation is awarded a reasonable allowance for the services of members of the Advisory Medical Committee attending such hearings and reasonable allowances for the services of members of the Advisory Medical Committee for making investigations in connection with all claims for compensation on account of occupational diseases, including uncontested cases, as well as contested cases, and whether or not hearings shall have been conducted in connection therewith. All such charges, fees and allowances to be collected by the Industrial Commission shall be paid into the General Fund of the State Treasury to constitute a fund out of which to pay the expenses of the Advisory Medical Committee.

In the event the amount appropriated by the General Assembly and the charges, fees and allowances so assessed and collected and paid into the State Treasury shall not be sufficient to pay the full cost incurred by the Advisory Medical Committee in making examinations of employees, and conducting postmortem examinations, and in making investigations of claims arising under this section, and in testifying before the Industrial Commission, the Industrial Commission shall assess against the employers found by the Industrial Commission to be subject to the hazards of asbestosis and/or silicosis an amount sufficient to pay such cost, said amount to be assessed against such employers pro rata on the basis of annual payroll. The Industrial Commission is authorized to assess and collect in advance in the beginning of any year from the employers subject to such hazard an amount estimated as necessary to pay such cost. Said amount when so assessed shall be paid by such employers within 10 days after the notice of assessment. and when collected by the Industrial Commission shall be paid into the State Treasury as a part of the fund out of which to pay the expenses of the Advisory Medical Committee. In the event such amount so assessed shall be found to be in excess of the cost incurred by such Advisory Medical Committee in the performance of its duties under this act, such excess shall be credited against the estimate of the cost to be incurred by said Committee for the succeeding year. In case the amount so assessed shall be insufficient to pay such cost the Industrial Commission is authorized to make an additional assessment to be made at the end of the regular assessment period and to be collected from the employers subject to the hazards of asbestosis and/or silicosis.

(v) The Industrial Commission shall make inspections of employments for the purpose of ascertaining whether such employments, or any of them, are subject to the hazards of asbestosis and/or silicosis, and for the purpose of making studies and recommendations with a view to reducing and/or eliminating such hazards. The Industrial Commission, and/or any person selected by it, is authorized to enter upon the premises of employers where employments covered by this act are being carried on to make examinations and studies as aforesaid. Any employer, or any officer or agent of an employer, who unreasonably prevents or obstructs any such examination or study shall be guilty of a misdemeanor.

(w) If any part or parts of this act be decided by the courts to be unconstitutional or invalid, the same shall not affect the validity of this act as a whole or any part thereof other than the part or parts so decided to be unconstitutional or invalid.

(x) This act shall be in force and effect from and after its ratification. (Ratified March 26, 1935.)

(y) All laws and clauses of laws in conflict herewith are hereby repealed.

Occupational Diseases — Real and Supposed*

SO widespread seems to be the current agitation for engrafting on to the system for compensating for industrial injuries a system of compensating for disability or death following occupational diseases, it would appear appropriate for us to stop and consider just what we mean when we talk about "occupational diseases," and what burden of responsibility we think to fasten on industry thereby.

The idea of compensating for occupational diseases is not new. Probably the earliest such law (although not a compensation law in form) was the Swiss law of 1877 and the idea came to this country by way of England. Theoretically there is good reason to compensate an industrial victim whose disability came about

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through exposure to or contact with industrial material of a poisonous nature or capable of producing serious morbid disorders. Such a condition of disability is as directly a result of the industrial process as is a disability due to an accident or injury. Much difficulty arises, however, when we attempt to define and delimit the conditions truly due to the occupation or an industrial process in which the worker was engaged.

It so happens that the writer has had a rather extensive contact with occupational disease and workmen's compensation legislation and administration of such laws. He was first secretary and later a member of the New York State Industrial Commission, administering the compensation law in its early days, when occupational diseases did not constitute any concern of our law. In 1920 we recommended and brought about the enactment of our occupational disease law—one of the first to be enacted in this country. In the conferences leading to the drafting of that law, we had to consider whether to adopt the general undefined and all-inclusive method of bringing such diseases under the coverage of the act, or to adopt the method of specifying the diseases that were to be covered, and the conditions of employment giving rise to such diseases. After careful consideration it was determined to adopt the English method and specify or set forth in a list or schedule the particular diseases that were recognized as characteristic of and peculiar to the employment, and so give rise to a right of compensation.

In the light of current misapprehension on the subject, it may not be amiss to review briefly what we understand by the so-called schedule method of providing coverage for occupational diseases, and what is really intended by those who put forward the all-inclusive undefined occupational disease provision.

THE SCHEDULE METHOD: We all start out with the proposition that all diseases fairly chargeable to an industry should be compensated by the industry. We differ, however, in the method of coverage, and the difference in method means vast difference in the rule of liability and the burden imposed upon industry.

A schedule of occupational diseases named in the law can be and should be full and complete and should include every known and distinguishable disease characteristic of industry. Lead poisoning is characteristic of painting, lead smelting or grinding or any other industrial process involving the use of, contact with, or exposure to lead in any form. When a worker contracts lead poisoning, the industry in which he has been employed is responsible, and should be obliged to make compensation for the disability that ensues, and to furnish adequate medical treatment to effect a cure. The same may be said of illness caused by arsenic, mercury, chromium, benzol, wood alcohol, aniline and very many other metals, acids, alkalies, and chemicals of various sorts. Similarly diseases from handling hides or skins, or from contact with animals, such as anthrax and glanders, are properly the subject of compensation.

In our New York law we have a schedule of diseases contained in some 27 separate paragraphs, but the number of conditions covered has been uncounted and includes literally hundreds of diseases, or occupational conditions.

Under such a law, industry knows the liability under which it must operate; it also knows definitely the conditions against which it must guard! To this extent it is a great aid in the preventive treatment of diseases. The workman, too, is by the law put on his guard against the very conditions of disease that may be disabling, and he knows what his right of compensation is in case of disablement.

Moreover, because it is definite and reasonably certain, it is possibly reasonable to estimate the cost, and industry can procure protection by insurance at costs fairly definite and within the ability of industry to pay.

Moreover, by such method a degree of certainty in the application of the law is obtained, which greatly facilitates its administration. Any other method, such as the vague, undefined and all-inclusive method, will give rise and lead certainly to a great volume of litigation, all looking to court interpretations as to what is and what is not an occupational disease, necessarily imposing delays and raising false hopes in many cases. The "schedule plan" by its certainty of terms avoids much of such litigation, the avoidance of which is one of the primary purposes of compensation statutes.

This is the sane, the definite, the sensible way to charge upon industry its liability and responsibility for occupational diseases. It is also the scientific way and the legislatively correct way.

This view has been approved in other jurisdictions for we find that in England and on the continent, as well as in the British dominions, the schedule method of covering occupational diseases has been uniformly followed.

THE ALL-INCLUSIVE METHOD: There is being advanced in these days the idea that an occupational disease law to be comprehensive should also be vague, uncertain and undefined. This idea is expressed in many proposed legislative bills in such language as "any and all occupational diseases"; or, "occupational disease shall be construed to mean any disease incident to the employment or any process thereof."

We may well wonder whether we say what we mean, or mean what we say, when we use such vague and uncertain terms. If certainty can be attained, it surely is greatly to be desired in preference to uncertainty. If the legislature, with the advantages it has of all the research and study of the subject that have been given to it by Labor Department technical experts, by industrial doctors, by official commissions and by learned societies, can define an occupational disease, it should do so. How unfair, it would seem, to pass the task on to the commissioners or referees, who in administering the law will be obliged to make their own definitions in litigated cases coming before them. Not only will they then be lacking in any kind of legislative standard to guide them in reaching a proper conclusion, but they will be forced to make rulings when interested parties, perhaps widows and children, are before them seeking relief, with all the natural sympathy that is attendant upon such a proceeding.

Great danger lies in the fact that such general and vague language will lend itself to the inclusion of any and every sort of illness and disease to which human flesh is heir. We surely do not think of colds, pneumonia, tuberculosis, pleurisy, kidney disease, high blood pressure, heart disease, apoplexy, appendicitis and cancer as occupational diseases. Yet will claims be denied for such conditions, when a doctor is produced and gives an opinion that they are traceable in some way or degree to employment? It is not needful that the doctor be expert; he may even be interested, to the extent at least of collecting from an insurance company a large bill for medical treatment. The question of whether or not the given condition of illness arose from or was incident to the employment is legally a question of fact, and commonly from decisions on questions of fact there is no appeal.

In the consideration of such a case, we must not overlook the fact that under many laws, such as the New York statute, when the employment is established, the disease contracted, and the disablement shown, the presumptions expressed in the law make it almost obligatory on the administrative officer to find that the claim is allowable. It will be seen, therefore, how little protection industry will have from unwarranted claims for conditions of every day life. Sections 21 and 47 of the New York compensation law contain language that clearly expresses these legal presumptions, and the presumptions are expressed either by statute or court interpretations elsewhere.

Let us assume a case. A man dies of pneumonia. It is found he worked in a laundry. The evidence shows he was around in and out of a steam filled room. He has so worked perhaps for years with no ill effects. A doctor is brought in, however, who says under oath that in his opinion work in a steam filled room was the proximate or final cause of the death.

What the man's personal habits or home surroundings were is of no consequence; whether he was an alcoholic, whether he has been in the habit of roistering about at night, whether coming home from a picture show in the rain he got his feet and clothing wet, whether any of a hundred causes might have existed, we may not know. Even knowing them and presenting proof of them, they might and often would be disregarded. Thus from circumstances surrounding a particular case and the natural sympathy aroused by it, we find pneumonia being classed as an occupational disease—a disease as widespread as the human race and one that is not essentially characteristic of and peculiar to industry.

Or let us take another illustration: an old man becomes almost blind of senile cataracts, a condition very commonly found in elderly people in all walks of life. For years he faced

a window in the factory where he worked. At certain hours of the day there was a glare of light in the windows. A doctor testifies that due to the light he had eye-strain and inflammation of the eyes, that while this glare might not cause the cataracts, still in his opinion it hastened the course of development and resulted in the disabling condition of the eyes sooner than would otherwise have been the case.

What shall the commissioner or referee do then? Deny the claim? Hardly. More likely it is that this condition will be held to be an occupational disease, under the all inclusive indefinite provisions of the law; and thereupon senile cataract will become established as one of the diseases for which industry must pay.

Yet deep down in our consciousness we know that this condition of life, this incident of old age, is not a condition for which industry is responsible.

These illustrations are not exaggerated. They have already occurred under such statutes, and as time goes on they will become more prevalent. They could be multiplied many times.

What then will result? The worker who becomes disabled by illness or perchance dies of disease will in many cases, become a direct liability of the industry by which he was employed. This is literally health and life insurance for workers at the expense of the employer. No such obligation belongs on industry by reason of dangers caused by industry. No such obligation should be placed on industry.

If industry is to care for and compensate for all the diseases of life affecting industrial workers, what shall we say of the unfortunate lot of those who fall victim to disease but who have no employer to take care of them? Should the workers be set up as a preferred class, to receive large benefits from their employers for conditions for which the employers are not responsible, while at the same time, the unfortunates, the non-workers, the self-employed and the unemployed, are placed at an even greater disadvantage, and the disparity even more emphasized? It hardly seems fair.

BURDEN OF COST: What of the burden of cost of such all inclusive occupational disease laws? Can industry absorb this additional cost in states enacting such laws without being at a serious disadvantage in competition with industries in states having no such laws? Can industry survive in the face of such increased cost of production? This is a matter that should give us pause. Let us not load down industry with responsibilities not peculiarly belonging to it, and which may be beyond its capacity to assume.

There is nowhere an accurate or complete experience upon which to predict the cost. We have, however, some fragmentary experience to go on. In some industries, under an all-inclusive occupational disease law, it was found after a few years that almost 90% of their losses were due to disease, while only 10% were due to accidents. If that were a true index of cost we would find that our present accident cost of 10%, would increase nine times. This tremendous increase would have to be spread by way of premiums over all industries, the non-hazardous being obliged to take up their share.

With compensation insurance premium rates already at the peak point, and with many industries now barely able to buy the protection the law requires them to have, it is not a pleasant picture to contemplate, if this excessive load is to be cast on industry's shoulders. Whether industry buys its protection from insurance companies or from a state fund, or whether it assumes the whole obligation under a self-insurance plan, the cost of all these diseases will have to be met by industry. There will be no escape from it.

The only way industry can avoid this crushing burden is to see to it, insistently so, that the legislatures do not enact all-inclusive occupational disease laws in broad general terms. The only safe and scientific way is to insist that where occupational diseases are to be included in the law, it should be done in the definite scientific way by including all diseases known to be peculiar to the occupations in a schedule or list contained within the law itself. It is then a perfectly simple matter, as new processes develop new types of disease, and they can be medically and scientifically described and recognized, to include them as additions to the schedule, as has already been done in some states.

DUST DISEASES: There has come to be recognized in the last few years a condition of the lungs known as silicosis, due to the inhalation (over long periods of time) of dust containing silica. A similar condition known as asbestosis is said to occur among workers in asbestos.

These affections of the lungs become in long time permanently disabling, and if they become complicated with certain other diseases, such as tuberculosis they cause death. In the earlier stages this condition is sometimes, though not always, recognizable, but it is not to any appreciable extent disabling. The first appearance of the disease, however, is a warning that the individual must change his occupation and get out of the dust creating industry if he is not to become permanently disabled or meet early death. These "dust diseases" are in a class by themselves. They call for special treatment and for special rules for the consideration of such claims. The subject is highly technical and presents many difficulties. It is generally accepted as a fact that there are right now thousands of workers in inorganic dust whose lungs are to some extent affected by silicosis. Plainly all of these persons cannot be put out of the industries where they are employed; neither can industry possibly pay the huge sums in the aggregate that it would be necessary to pay if the law suddenly recognized that all of these thousands of workers should be compensated in money, not for what thereafter develops but for the exposure already incurred over the years that have passed. To attempt to saddle such a load on industry would swamp it beyond the hope of recovery. The economic effects of such action would be most disastrous. The destruction of industry would mean not only that such sufferers would get no compensation, but would result in greatly increased unemployment and untold distress.

A model law for silicosis must contain many detail provisions other and different from the provisions for occupational diseases generally. It must make provision for recognizing the various stages of the disease, for periodic medical examinations, by x-ray and otherwise, to detect the earliest beginnings of the disease, and the steps to be taken when the presence of the disease is recognized. Also provisions must practically be made for a gradual assumption of the liabilities, so that the already accumulated cases are not at one time loaded on the industry, creating a burden impossible of assumption.

Industry does not object to the inclusion of such conditions in the law in a practical way. It recognizes the obligation to compensate for silicosis and asbestosis. It will take the burden so far as it practically may, doing justice to the worker and preserving the industry upon which the worker is dependent.

The foregoing facts will illustrate in a brief way the utter necessity for sane thinking and practical approach to this very complicated and difficult problem. If we would do only lip-service to labor, we would say give us an all-inclusive occupational disease law. If we would do a real and lasting benefit to labor, we will courageously meet a baffling situation with a practical remedy, we will make difficult the exploitation of labor by racketeers, and we will by enacting a schedule law for occupational diseases reach all real situations and at the same time permit industry to survive.

Significances and Coincidences

NEVERTHELESS **Let There Be "A Doctor in the House"**—"Democracy favors specialization, but will credit the specialist only where his views receive and survive open-minded, critical inquiry. It will defer to the physician in treatment of cancer, but will demand to share in determining public policy concerning socialized medicine, for there the general judgment may be sounder than medical men's judgment colored by self-interest."—**Antioch Notes.**

Not Even by Sec. 7A—"A proper relationship between men and management cannot be accomplished by legislation."—Charles R. Hook.

Test for Miners — The scientific name for "miner's asthma" is pneumonoultramicroscopicsilicovolcanokoniosia. If you can say it, you haven't got it.—**Arkansas Gazette.** From **Literary Digest,** "Topics in Brief."

Coincidence—Industrial Medicine for February, 1935, apropos of the doctors' attitude toward the many lay proposals now being made for regulating the practice of medicine, had an editorial entitled, "Is There a Doctor in the House." Now comes **Saturday Evening Post** of April 6 with the first installment of a two-part story under the same title, minus the quotes.

THE BULLETIN

of

The American Association of Industrial Physicians and Surgeons

THE object of this Association shall be to foster the study and discussion of the problems peculiar to the practice of industrial medicine and surgery; to develop methods adapted to the conservation of health among workers in the industries; to promote a more general understanding of the purposes and results of the medical care of employees, and to unite into one organization members of the medical profession specializing in industrial medicine and surgery for the mutual advancement in the practice of their profession.

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1935 ANNUAL MEETING
American Association of Industrial Physicians and Surgeons
Philadelphia, Pa.
June 10-11, 1935
Pennsylvania Hotel: Headquarters

Proposed Amendments to the Constitution and By-Laws

Constitution:

Article III, Section 1, line 10: after "honorary" insert "and associate." Section 3, line 1: strike out "or associate."

Article V, Section 1, line 2: after "President" insert "President-Elect." Section 1, line 3: after "Secretary-Treasurer" insert "one Vice-President shall be chosen from the membership east of the Mississippi River and one from the membership west of said river."

By-Laws:

Article II, Section 1, line 1: after "active" strike out "and associate." Section 1, line 4: after "honorary" insert "and associate."

Tentative Program

Annual Meeting
American Association of Industrial Physicians and Surgeons
Philadelphia, Pa.
June 10 and 11, 1935

Monday, June 10:

9:00 A.M.—Business Session and President's Address.

9:30 A.M.—General Round Table—"Present Status of Physical Examination"—Drs. Gehrmann, Pearsall, Taylor and others.

12 Noon—Lunch.

1:30 P.M.—"Industrial Vision"—Dr. George Cross.

2:00 P.M.—"Industrial Neuroses" — Dr. Clarence Patton.

2:30 P.M.—"Injuries In and About Joints" — Dr. deForrest Willard.

3:00 P.M.—"Arthritis" — Dr. Pemberton.

3:30 P.M.—General Discussion.

Monday evening, 8:00 P.M., guests of the Philadelphia College of Medicine, Industrial Division. Program arranged by Dr. H. F. Smyth.

Tuesday, June 11:

At the University of Pennsylvania Hospital:

9:00 A.M.—Dr. Alfred Stengle and staff.

11:00 A.M.—Dr. Charles Frazier and staff.

12:30 P.M.—Lunch.

2:00 P.M.—"Occupational Disease" —Dr. Hayhurst.

2:30 P.M.—Presentation of Cases—Dr. Fred L. Hartmann.

3:00 P.M.—"The Chest Lesions of Industry" — Dr. Pendegrass and staff — X-Ray Department.

3:30 P.M.—"Industrial Dermatosis" —Dr. Fred Wydman.

4:00 P.M.—General Discussion.

5:00 P.M.—Demonstration of Apparatus and Methods for Determining Health Hazards in Industry—Dr. H. F. Smyth and staff.

7:30 P.M.—Annual Dinner at Hotel Pennsylvania — Speaker will be some prominent Industrialist.

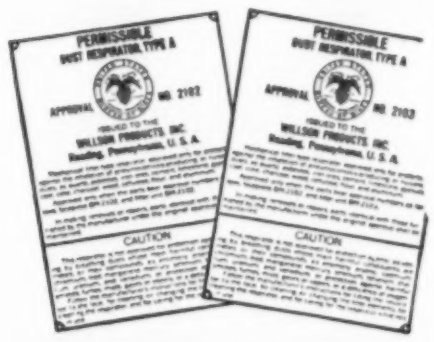
THE program for Tuesday, June 11, at the University of Pennsylvania Hospital, will be in the nature of general clinics, with the presentation of cases demonstrating the various subjects.

This is only a tentative program and may be subject to some changes.

Headquarters will be at the Hotel Pennsylvania, 39th and Chestnut Streets, Philadelphia, Pennsylvania.

No. 400

Patent Applied For



UNITED STATES Bureau of Mines Approves Two New

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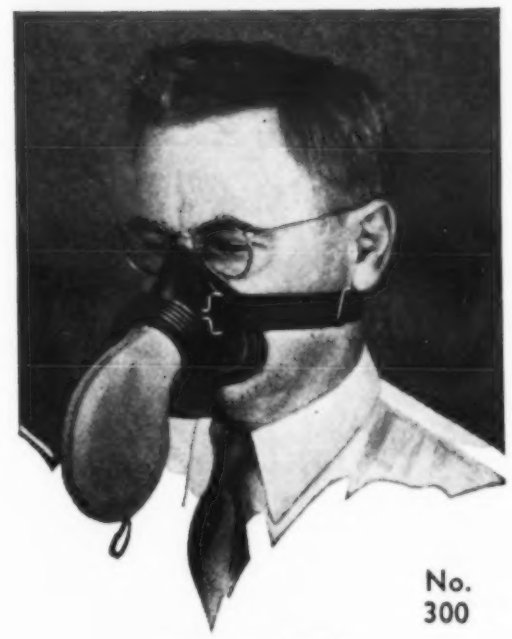

No. 300

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It is equally gratifying to us as manufacturers of respirators to obtain this official stamp of approval since it justifies the claim we make for our product. It would lack consistency for us as respirator manufacturers to make a claim for our product and then fail to jump at the opportunity to prove it officially. We feel this is especially important since a false claim of efficiency by a respirator manufacturer may result in loss of health to many of his customers' employes.

Economical upkeep is one item not considered in Bureau of Mines Schedule No. 21, which is of great importance to Industry. A difference of even a few cents a day per respirator would amount to hundreds of dollars monthly in many plants. If you are not familiar with these new approved respirators, order samples today to test their exclusive features. Write Willson Products, Inc., Reading, Pa., for the name of our distributor nearest to you.

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The Industrial Doctor

OFFICIAL SECTION OF THE NEW YORK STATE SOCIETY OF INDUSTRIAL MEDICINE

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Role of the X-Ray in Industrial Hygiene

DURING* the past few years, especially since the beginning of the depression, there has been a tendency toward increase in the number of suits for damages by employees against employers. This increase has been found in all forms of industrial injury and occupational diseases.

A statement published by the Ohio Industrial Commissioner in the Ohio Industrial Commission **Monitor**, September, 1932, states: "Due to the liberalized interpretation of law laid down during the period of the depression, constant and intensified effort on the part of a great many claimants and their representatives to employ every known avenue for reopening of old and all but forgotten claims, seeking to restore thousands of one time injured workmen to compensation benefits, appeals to the courts have grown in astounding numbers and, without legislative remedy, the scope of the drainage upon the available funds is problematical."

This condition is not confined to Ohio alone but is prevalent throughout the entire United States.

One of the most likely etiological factors is, first of all, the reduction in employment along with the unrest of the populace in general. Many of the employees have had employment which enabled them to participate in a fair standard of living. The great majority of these individuals did not provide for the rainy season and when employment ceased, so did the bread and butter.

People in this state of mind are easily influenced by the cohorts of shady attorneys.

They are led into court as the sheep to the slaughter.

These individuals are led to believe that they are sick even if they are in good health generally. A smooth-talking, high pressure attorney will promise them damages, far exceeding the probable amount. The only requirement insisted in is that they follow the attorney's instructions. It is an easy thing to sell a person a scheme or racket of this character, and many of these individuals eventually believe that they are entitled to damages. If they were not ill to begin with, it is almost certain that before they have completed the procedure to which they are subjected, they will at least have a headache. The majority of them feel that they are suffering the tortures of the damned from some disease or injury incurred from their occupation; consequently the dockets of the courts are filled with suits for damage incurred from industrial injuries and occupational disease.

Probably the greatest number of cases have developed in occupational diseases in relation to the chest, particularly pneumoconiosis with its several divisions as silicosis, anthracosis, analine dye irritation, etc.

This particular situation has driven the insurance companies to cancel their industrial insurance on a number of different kinds of manufacturing, such as those which include grinding, molding and all branches of industry that have dust hazards. This phase of the situation has driven the employers to some oasis whereby they can secure a form of insurance that will protect them from the ravages of the misdirected employee.

It is impossible for the smaller manufacturer to assume his own liabilities, for the reason that if he were to have a suit for damages amounting to several thousand dollars it would probably cause him to lose his business, especially in times like these.

A few of the insurance companies have decided that they are willing to take the risk of placing insurance with manufacturing concerns who have an occupational hazard, if they can be satisfied that the employee is not, at the time of issuance of the insurance, suffering from one of the forms of latent disease or antecedent disease that may be aggravated by his or her employment. These conditions have been legislated to be allowed compensation if it is shown that they are excited to activity or aggravated to any degree. Therefore they demand of the employer an examination that will satisfy the medical departments that any disease, occupational or otherwise, does not exist to be aggravated by the present occupation. As an instance, any pulmonary pathology might be construed as being caused or aggravated by an occupation. It is necessary to rule out all forms of chest pathology. For example: An employee having tuberculosis in any stage should not be permitted to work in a position which would have a tendency to cause irritation of the mucous membranes. An individual with heart or aortic-changes should be guarded against occupational strain.

There is no better method of obtaining permanent records of normal or pathological conditions of the organs of the body than the preserved x-ray films of any part of the anatomy. A comparison of x-ray examinations over a given period of development or recession of a disease excels any form of physical examination. For it can be visualized at its various stages and comparisons are most exact. These records can be preserved over a long period of time and can be examined as frequently as necessary under the same conditions by a number of different individuals. Physical examinations can also be recorded, but it is impossible when a difference of opinion exists at some later date to actually have the patient before you under the identical condition to settle the dispute. Different impressions of the physical findings are quite frequent,

* By Paul G. Dick, M.D.; read before Illinois Medical Association Section of Radiology, at Springfield, May 16, 1934, and publihsed in *Illinois Medical Journal*, March, 1935.

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while the x-ray films record only those conditions that exist. A comparison of films has already proved its worth in some of the cases when pre - entrance examinations have been made and reported by Dr. Bohart for the Belt Line Railroad. These examinations were of the spine alone.

An x-ray examination of the chest is the most reliable means of determining the changes of a chronic inflammatory process such as is found in the several divisions of pneumoconiosis. This film can be retained as a permanent visible record of the existing changes, if any; and if a disease develops during the employment of an individual who has a recorded normal x-ray it would be a much easier process to establish the causative factor and responsibility. The insurance companies have adopted a rule requiring this kind of procedure before insurance will be issued to manufacturers having occupational hazards. Furthermore according to a report of the American Railway Association, out of a total of 1,192 back examinations 798 variations and diseases were found that were not detected by physical examinations. The insurance companies demand that these examinations will be made by a reputable radiologist of their choice. If these examinations are carried out along proper lines and the records are properly filed and preserved, I am of the opinion that the end will be most gratifying to industry at large and that insurance companies will be well repaid for their efforts along these lines: also that the employee will benefit, since deserving employees will not be inconvenienced by costly court procedures and it will not be necessary for them to give a great part of their compensation to so-called ambulance chasers. In fact, it is my belief that in a short period of time the same procedure will be carried out in other fields of the x-ray, especially in examination of bones. It is thought that all lines of industry having occupations hazardous to bones, will eventually require a complete x-ray of the bony skeleton before accepting an employee and, should there be existing previous injury or some congenital variation of bone, a non-contestible record of this fact will therefore be available. It is an established fact that there is as much if not more compensation paid for existing congenital deformities, hypertrophic bone changes, and other existing bone deformities than there is for actual traumatic lesions or occupational diseases.

Data gathered from the members of the Chicago claim agents of all Class A railroads entering Chicago, indicate that the number of claims from personal injury to employees have decreased 76% since 1923.

This is apparently due to the intense Safety First Campaign which has been carried on by these companies. But quoting another paragraph from a letter by the secretary of this organization, he states:

"On the other hand, I am of the impression, and quite a few of the other railroad claim men agree with me, that we have had in the past few years of the 'depression' more litigation involving questionable cases or cases entirely without merit than at any time during the last decade. In other words, there has been an increase in cases where the disability was not due to trauma or had no connection with trauma, although in some of these cases it would be hard to prove the line of demarcation between trauma and disability from disease. In these days of 'hard times' employees suffering disability usually try to figure out some way that the disability can be linked up with an accident. We have had a host of cases wherein hernias are just being discovered and the person afflicted claims it is due to a strain or overlifting or something of that sort at some time in the recent past, although no report was made of the alleged 'accident' at the time it actually occurred."

At the present time it is hard to convince an employer to spend a sum possibly aggregating twenty-five dollars for each employee as an entrance examination since this amount would appear entirely prohibitive to him. However, if insurance companies refuse to insure the employees and the employer has a few large damage suits fastened on him, it will be a much simpler task to convince him of the economic advantage of a thorough entrance examination.

I have been fortunate during this time of financial distress in having some of the insurance companies refer cases to me for chest examinations for existing pneumoconiosis. It was especially interesting to see the amount of existing pathology that was found in the chests of unsuspecting individuals. The pathological changes in the majority of these cases could easily be made a basis of law procedures although few, if any of them were actually due to occupation. However, if damage suits were entered, they would be very difficult to defend.

In one series of cases—an industry manufacturing stoves, in which there are many occupations considered very hazardous for the several forms of pneumoconiosis—three of the employees had a suspicious pneumoconiosis; or only 3% had any suspicious x-ray findings of this disease.

On the other hand, many of the chests presented evidence of pathology all of which were probably contracted from other sources than their occupation. It is possible that the great majority of these diseases existed prior to employment unless the firm happened to be one of very long standing and the employees had been with them for a long period of time.

Other evidences of pathology found as follows:

Tuberculosis	3
Gun shot wounds	1
Pleurisy (chronic)	9
Hearts (enlarged)	1
(mitral disease)	2
Aortitis	6
Calcified glands	4
Pneumoconiosis (early first degree)	3

Assuming that in the majority of industries this is the average of individuals who have some of the before mentioned conditions existing, it will be readily seen that if they were influenced to sue their employers for occupational injuries or dis-

Central States Society of Industrial Medicine and Surgery

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1935 Annual Meeting, Hotel Faust, Rockford, Ill., May 21, 1935

ease, the cost of defending the cases alone would so far exceed the original cost of examination that there would be no comparison. One adverse decision in the courts would increase this percentage many times.

Aside from the fact that the employer can be protected from the ravages of the unscrupulous lawyer by this form of examination, it also enables the conscientious employer to place his employees in positions which are not hazardous to their constitutions, and which enable them to guard their health better and to continue as wage earners for a longer time. If an individual with some existing pulmonary pathology, contracted from some source other than his occupation, should continue in a position where there is a dust hazard, his condition would in all probability be aggravated; if he were given some less hazardous work with a better chance for his recovery much could be accomplished both for the employee and the employer.

It seems to me that we as physicians and radiologists are doing our part in promoting this phase of our profession, which certainly cannot be construed as anything but beneficial to the public at large, in both an economic and hygienic way. It is a field which I believe will expand, in that all industries that now require physical examination will eventually require some kind of an x-ray examination in connection with the physical to obtain a permanent record of the employee's state of health at the time of entering employment. This would not only protect the employer but it would be far reaching in its effect on the employee. It would enable those responsible to place an employee in an occupation in which he would be shielded from hazards, which would not tend to aggravate an existing disease or to develop some other condition from occupation which might be predisposed by an existing variation from the normal.

There is no doubt that a certain proportion of the individuals who are employed at the present time would be, under conditions as I have outlined, cast aside. For this reason a program outlined for employment according to the individual's physical ability to carry on under the proper hygienic measures would be frowned upon by a certain group. I believe, however, that eventually these conditions would have a tendency to correct themselves and employment in the proper walks of life would be available for all.

SUMMARY: Owing to the changes in the industrial world which have placed a different conception on physical examination of employed individuals, and following in line with the trend for better hygienic surroundings for the employed along with a tendency to eliminate racketeering in regard to the physical hazards of the employed, a responsibility is placed on us, as physicians and radiologists, to promote a program that will eventually lower insurance rates for the employer; take away fees from unscrupulous lawyers, and produce more revenue for the radiologist.

DISCUSSION: Dr. T. D. Cantrell, Bloomington: I have nothing but commendation for the paper. The valuable permanent records would no doubt forstall many suits and be of benefit to both the employer and the employee. The examination must be complete and thorough so as to show any former injuries and any anatomical irregularities that render the laborer especially liable to disability due to usual strains.

I wish to call especial attention to the fifth lumbar vertebra. We sometimes find the lateral processes attached to the bones of the pelvis in such a manner as to immobilize the sacrovertebral joint. If such attachment becomes loosened so as to put a strain on the unused joint, pain on standing, walking or any labor will persist for at least five years or until a new joint is established.

I have also noticed neglected fractures of the body of the fifth lumbar vertebra with only ligamental or fibrous union which seems to carry the body weight on the ordinary work of life, as on a farm, but will not support the body in the erect position indefinitely. I found some in military service that could not withstand the hardship of drill and on x-ray examination were discharged from the service after months of punishment for malingering. These conditions cannot be diagnosed except by careful x-ray examinations. I have no doubt but such permanent records would lessen the number of suits for disability.

In my many years of experience on the Medicolegal Committee of Illinois State Medical Society I found we had little trouble with our patients. Our principal trouble was with unscrupulous attorneys, and I anticipate such is the case with industrial suits. I personally believe our worst is not to come but we are on the dawning of a new era. I note with great pleasure that many disreputable attorneys are being disbarred for dishonorable conduct, and we have reason to hope that the legal profession will soon be raised to a much higher plane. But we must remember such disreputable attorneys can make little progress without the assistance of our profession as expert witnesses, so let us have a care with our criticism lest it react on our ancient and honorable profession. We still have a few ambulance chasers.

Dr. George M. Landau, Chicago: I also had the pleasure of reading Dr. Dick's paper and I can only add to what Dr. Cantrell has said, my commendation for that paper. It is quite complete and precludes any discussion.

Dr. Dick has explained in detail the situation confronting the Radiologist in industrial hygiene.

In 1929, long before the era of silicosis, one of our railroads had the misfortune of hiring an individual who on his first day of duty claimed he was knocked down by a locomotive sustaining an injury to his shoulder. Roentgen examination revealed a well advanced sarcoma. At trial the jury awarded the claimant a large verdict, holding that the supposed injury sustained was the cause of this disease. Thereupon the company had installed in their employment office a complete x-ray unit and rayed all employees and those seeking employment as follows: chest, spine and pelvis. It has stood them in good stead then as well as now, for I have learned not so long ago that to date at least no claims have been made against them on the basis of silicosis and claims on injuries have been reduced where the injury sustained has been made a claim for aggravating pre-existing

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bone pathology or changes such as arthritis, scoliosis, etc.

I find among our industrialists a prevailing fear that the Roentgen examination of their employees' chests will lead the employee to assume that they, the company, are suspicious of an existing disease, and that their employees will of their own volition seek medical advice elsewhere which may form the basis of a suit on actual, imaginary or trumped up pathology. We are all aware of the unscrupulous lawyers and the tender-hearted juries awarding in such cases fabulous awards. I believe the time has come however when the fear and the possibilities of suit will have to be overcome on the part of the employer if, as Dr. Dick explains, insurance companies will not underwrite them where the hazard is great unless they can be assured that by physical and Roentgen examination those having or suspected of having any pulmonary disease have been eliminated.

In the State of Illinois today there are pending suits which if rendered in favor of the claimants will bankrupt several insurance companies. It matters not judging from a few of the verdicts rendered whether the disease be tuberculosis or bronchial asthma, if it be termed silicosis the jury renders a verdict in favor of the employee despite the sworn testimony of known reputable clinicians or radiologists.

Without question the radiologist's role in determining the question of the presence or absence of silicosis or the allied dust diseases is the paramount one.

Dr. Philip H. Kreuscher, Chicago: I am very happy to come before you this afternoon since I have watched the development of your section in the Illinois State Medical Society for a considerable time. I realize more than ever before that there is no section which deserves larger quarters with better ventilation than this one. There is increasing interest in traumatic surgery, and when I say traumatic surgery, I must include radiology since these two are so closely related that they cannot be separated. You have had before you today problems which should have been heard by a very much larger audience.

In the industrial world the subject of silicosis, which you have just been discussing, has taken a very prominent place. In Illinois this condition up to the present time has not been compensable, but I believe that the time has come when we as physicians should have a very much better understanding of this particular subject. I doubt whether there is one doctor in a hundred who could by physical examination or even by x-ray examination at the time when the patient is actually suffering make a diagnosis of silicosis. Because of this lack of understanding on the part of the physicians and surgeons many decisions are handed down in the courts which may not be entirely in line with the opinion of those who have given this subject extensive study. It is my understanding that one insurance company in this state has suits in connection with silicosis amounting to almost $500,000. One informant has told me that there are pending in the United States suits aggregating $2,000,000 on the subject of silicosis alone.

Discussions such as these and the ultimate publication of these papers and discussions and the dissemination of this knowledge to the doctors throughout the state is the one thing which will make meetings of this kind worth while. I hope that you will continue the study of this and other conditions in your Section on Radiology. I think you are doing a great work and wish you every deserved success.

Dr. C. O. Sappington, Chicago: Dr. Dick has given you a very excellent paper on an important subject, which will be of increasing importance in the near future.

I want to comment very briefly on this subject from the point of view of the specialist in industrial medicine and occupational diseases and try to "reach hands across the sea," so to speak, between those of us in that field and those of you who are in radiology.

It has been my unusually good fortune in the past 12 years to have viewed more than 50,000 chest plates and films with competent radiologists, from Boston to San Francisco, in a sincere attempt to discriminate between non-industrial disease and industrial disease.

Within the past few years, since we have had this so-called silicosis racket, I have seen a considerable number of films of the chests of men of more than 40 years of age who were subjected to dust exposure, and I have had the opportunity to compare those with the chest films of men also over 40 years of age who had had no similar exposure. The conclusion that has been reached out of that experience is this: Where the dusts were not appreciably siliceous in content and not productive of silicosis, it was impossible to distinguish between the increase in the markings in those two types of x-ray films, e.g., those who had a mixed type of dust exposure and did not have silicosis, and those who had no dust exposure whatever.

That brings me up to an important point and the information that insurance companies are requiring, and that is an estimate of the severity of dust exposure in the working environment. Briefly, this estimate should consist of a physical survey of plant conditions, with an occupation analysis of men involved, so you know what you are doing on that end of it.

This should be coupled with physical and chemical determinations with reference to the concentration of the dust, the particle size distribution, percentage of quartz contained in the dust, and also the exposure of the employees in terms of years.

When you relate all these data and correlate them with the clinical information and, above all, with the radiological findings which are very important, then you have a basis for the estimation of the hazard, which the insurance companies are going to find extremely valuable in adequate underwriting. Previously there has been no intelligent underwriting of occupational disease risks for the simple reason that they have done it by mere inspection. You and I can go out and tell whether a guard covers a wheel or not, and so can an insurance inspector. We cannot go into a plant and look at the air and say whether there is any lead or chromium vapor in it, or how much, nor can we say by looking at a cloud of dust whether it is dangerous or not. Consequently, these procedures are very important. I make a plea, therefore, that you associate these findings with your radiological data.

I wish I could share the view of Dr. Cantrell concerning the future of these court cases. I am naturally optimistic, but I think I have had enough experience in court cases to believe that the system is wrong. As long as you have jury trials, gentlemen, you are going to have these

difficulties because you cannot teach a jury. Even though you could get enough people who knew something about occupational disease scientifically (there being good reasons why you cannot) you would have great difficulty in convincing the jury that a man did not have an occupational disease, no matter what your array of defense might be.

I am very much interested in the statement made by our president regarding the total number of alleged silicosis claims now pending. I made an estimate of the claims over the entire country about a year ago. It was about $35,000,000 at that time, from the best I could find out about it. Today it is over $100,000,000, showing that there has been approximately 200% increase in one year. We must get together. That is exactly why I am making this talk to you. I will heartily cooperate in every way that I can in my line of work.

Current Publications

AMERICAN Public Health Association Year Book, 1934-35 (issued as a supplement to **American Journal of Public Health,** Vol. 25, No. 2, February, 1935) contains a number of reports of special interest to industrial physicians and surgeons. These are mostly committee reports, Industrial Hygiene Section, A. P. H. A., presented at the Sixty-third Annual Meeting in Pasadena, California, last September. Among them are:

Industrial Anthrax. Prepared by Dr. Henry F. Smyth (chairman) and Dr. Volney S. Cheney, this report, in Sec. 1, gives anthrax statistics for the U. S. for the 1929-1933 period, with tables of cases and deaths in 39 states, and cases as to sources of infection and treatment methods; and, in Sec. II, a review of 77 papers from current literature, under the headings "Source of Origin of Cases of Anthrax," "Anthrax Incidence in Europe," "Diagnostic Methods," "Types of Infection," "Treatment," "Prevention," "Culture Studies," and a summary of important conclusions. The references to the 77 papers are annotated.

Lead Poisoning Statistics for 1933. Frederick L. Hoffman, LL.D., Consulting Statistician, of Philadelphia, Pa., and a member of the Committee presented an exhaustive study which was accepted as the report of the Committee on Lead Poisoning.

Standard Practices in the Compensation of Occupational Diseases. Changes in the laws of the United States, bill and investigations and trends in various states, and changes in foreign laws are summarized by the Committee, of which Dr. Henry H. Kessler is Chairman.

Ventilation and Atmospheric Pollution. Dr. Emery R. Hayhurst (Chairman), Prof. Philip Drinker, Dr. Leonard Greenburg, Dr. William J. McConnell and Dr. Carey P. McCord are the members of this Committee. Their report is a summary of 62 questions and their answers, with the answers and comments grouped in five divisions.

Volatile Solvents. Here Dr. Henry F. Smyth (Chairman), Dr. Alice Hamilton, Dr. George H. Gehrmann, and Dr. William P. Yant review the literature of 1932 and 1933 and offer comment of their own. Alcohol and esters, aniline and its derivatives, petroleum products, benzol and its homologues, carbon bisulphide, chlorinated hydrocarbons, ethylene oxide, formaldehyde, furfurol, nitrobenzene, and dinitrotoluol and toluidine are the subjects of the general subdivisions of the report, with paragraphs on volatile solvents and spray coating, and a supplement on benzol, by Dr. Yant.

JOURNAL of Industrial Hygiene, for March, 1935, has four interesting feature articles and a 30-page abstract section.

The first of the features, "The Dust Filtering Efficiency of the Human Nose and Its Significance in the Causation of Silicosis," by Gunther Lehmann (from the Department of Physiology, Kaiser-Wilhelm Institute for Industrial Physiology, Dortmund) ends with the especially interesting suggestion "that the dust retaining capacity of the nose be used as an index of the individual's qualification for working in a silicosis producing atmosphere."

The second feature is "The Determination of Benzene in Air," by Warren A. Cook, from the Connecticut State Department of Health, and Joseph B. Ficklen, Travelers Insurance Company.

The third is "The Treatment of the Common Cold," by Harold S. Diehl. from the Students' Health Service, University of Minnesota.

The fourth is "Determination of the Comfort Zone for School Children," by Ruth C. Partridge and D. L. MacLean, from the Department of Physiological Hygiene, School of Hygiene, University of Toronto.

The Abstract Section covers 101 articles, mostly of foreign origin. Under the heading "General," four articles are abstracted; under "Systemic Occupational Diseases: Occurrence, Treatment and Prevention," three articles are abstracted; under "Poisonous Hazards and Their Effects: Gases, Chemicals, etc.," the subject matter of 27 articles is set forth; the heading "Dust, Smoke, Fumes, and Vapors: Their Determination and Elimination," has three; "Occupational Affections of the Skin and Special Senses," covers eight articles; "Hazards of Compressed Air, Diminished Pressure, Operation and Use of Electricity and Welding," has four abstracts; "Gas Masks, Respirators and Protective Equipment," contains three abstracts; "Industrial Physiology: Nutrition, Metabolism, Fatigue, etc." covers six; "Ventilating and Air Conditioning," eight; and "Industrial Environmental Conditions," three.

Books

The Treatment of Injuries of the Head and Spine. By Jewett V. Reed, M.D., Assistant Professor of Surgery. Indiana University of Medicine. 96 pp. 39 illustrations. 6¾x10 Paper. C. E. Pauley & Co., Inc., Indianapolis, Ind. $1.00.

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The usual medical text is of little value in meeting the modern medicolegal problems discussed by Doctor Gray, Silicosis, Buerger's Disease, Chromium Poisoning, the comparative values of permanent disabilities, etc., etc. A condensed table of contents follows:

Accidents

OCCUPATIONAL POISONS
Anthracosis
Asbestosis
Baker's Itch
Benzol Poisoning
Carbon Monoxide Poisoning
Carbon Tetrachloride Poisoning
Chromium Poisoning
Lead Poisoning
Manganese Poisoning
Mercury Poisoning
Methyl Bromide Poisoning
Silicosis
Sulphur Dioxide Poisoning

INFECTIONS
Bacteriology
Infection
Anthrax
Arthritis
Rheumatic Fever
Arthritis-Rheumatism
Glossary of Terms
Heart Disease
Osteochondritis Deformans
Osteomyelitis
Pannus
Syphilis
Paresis: Tabes
Trachoma
Trichomonas
Tuberculosis

NON-INFECTIOUS
Buerger's Disease
Compressed Air Disease
Fractures: Types and terms
Hernia
Hodgkin's Disease
Hydrocele
Pterygium
Radium
X-ray
Radiodermatitis
Sarcoma
Tumor
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manner the methods and procedures of treatment of injuries to the brain and spinal cord." He says: "these methods have been evolved and employed by the masters in this field of work; I simply describe my own way of employing these methods and principles as found most efficient in my own experience."

In this monograph Dr. Reed has accomplished his purpose. His handling of the subject begins with the injury, setting forth in a most readable way just what may be expected of the surgeon who reaches the case before the patient has been moved. In this respect the work is of special value to the physicians and surgeons who administer the immediate treatment to patients with injuries to the head and spine. But it is none the less complete and valuable in all respects of subsequent treatment. The book is outstanding in its susceptibility to use by those doing industrial and traumatic surgery.

What You Should Know About Heart Disease. By Harold E. B. Pardee, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical School; Associate Attending Physician, New York Hospital, etc., 2nd Edition, thoroughly revised, published 1935. Small 12 mo, 127 pp., illustrated. Lea & Febiger, Washington Square, Philadelphia, Pa. Cloth. $1.50, net.

ONE result of the activities of the numerous Heart Associations which have been formed throughout the United States in the last 10 years is that "many people have come to ask: "What is this heart disease about which we hear so much?" An important purpose of this book is to enable the ordinary person — who finds it difficult to learn about heart disease, since the facts are usually not written in terms which one without medical training can understand —to know the answer, to comprehend what is meant by "heart disease" and how it may lead to sickness. And another purpose is to enable a patient who has heart disease to understand thoroughly his own condition, since "the better he is able to do this, the better will he be able to aid in his own cure by cooperating with the physician who is trying to correct the unpleasant results of the condition. The patient wants a clearer conception of the importance or unimportance of such ominous sounding terms as 'murmur,' 'leaking valve' or 'enlargement'; he wants to know what is harmful for him to do and he seeks instructions sufficiently detailed so that he may not fail to grasp anything of vital importance." Both purposes are accomplished; this book tells the patient just what his physician wants him to do and enables him to assimilate its sound directions at his leisure. Its tone is optimistic, its advice is authoritative, and its purpose is helpful. "For these reasons physicians prescribe this work for their patients as a means of avoiding the danger of adding cardiac neuroses to an existing organic disease. It is concise, but surprisingly complete. It will simplify the doctor's task and clarify his instructions."

BOOK NOTICES in **J.A.M.A.** for April 6, 1935, describes "The Pneumonokoinoses (Silicosis)—Bibliography and Laws," as follows:

The Pneumonokonioses (Silicosis): Bibliography and Laws. By George G. Davis, M.D., Associate Clinical Professor of Surgery, Rush Medical College, University of Chicago, Ella M. Salmonsen, Medical Reference, Librarian, The John Crerar Library, Chicago, and Joseph L. Earlywine, Attorney at Law, Chicago. With a foreward by E. R. Le Count, M.D., Professor and Chairman, Department of Pathology, Rush Medical College, University of Chicago.

AGRICOLA in 1556 referred to dusts in his 'De remetallica'; likewise, late in December, 1933, Sappington commented on the problems dust in relation to disease. In the intervening 377 years at least 2,766 other publications were made, related directly or indirectly to the influence of dusts on living organisms. The citation of these hundreds of publications with many types of cross references, together with a large section devoted to compensation laws, make up the contents of this large publication. By its authors it is described as 'a reference book designed for the permanent convenience of physicians, surgeons, lawyers, industrial executives, librarians, journalists, engineers, trade association officials, students and research workers.' The amount of labor expended manifestly was enormous—perhaps out of proportion to the extent to which the book will be applied. For the industrial hygienist, whether physician, engineer or other public health worker, the book provides both a historical background and the most recent concepts as to the significance of the various types of dusts in human economy. For attorneys connected with the adjudication of claims for dusty lung diseases, it will furnish data on almost any conceivable aspect of such disorders. Librarians will be saved many hours of compilation work through the presence of the book on their shelves. For the average practitioner who does not delve into medical history and who may not be concerned with dusty lung diseases, it holds no promise of great usefulness. A thorough reading of the book alone will in no wise equip a physician either to recognize or to control silicosis or any other form of pneumoconiosis. The volume is what it purports to be—a pure bibliography, with citations of compensation laws. At the outset it gets off to a bad start through the language of its title. Although silicosis is the chief form of pneumoconiosis, it is improper to imply, as the title does, that silicosis' is 'the pneumonokonioses' or vice versa. Such ambiguities naturally are the outgrowth of the compilation of highly technical materials jointly by a professor of surgery, a medical librarian and an attorney at law."

Conferences

North Carolina Industrial Safety

IN connection with the Sixth Annual State-wide Industrial Safety

Conference which will be held at the Washington Duke Hotel, Durham, N. C., Thursday and Friday, May 9 and 10, the program has been arranged so as to stress occupational diseases and their prevention, and the care of minor injuries to prevent infections.

Dr. R. R. Sayers, Medical Officer in charge of Industrial Hygiene and Sanitation, United States Public Health Service, Washington, D. C., will talk on "Occupational Diseases Caused by Chemicals."

Dr. William J. McConnell, director, Industrial Health Section; Assistant Medical Director, Metropolitan Life Insurance Company, New York City, N. Y., will talk on "Measures of Dust Control."

Dr. R. M. Little, director, Rehabilitation Division, New York State Education Department, Albany, N. Y., will talk on "Rehabilitation and the Curative Workshop."

G. C. Bateman, Secretary, Ontario Mining Association, Toronto, Canada, will talk on "Dust Diseases From the Operators' Standpoint."

Dr. G. H. Gehrmann, Medical Director, E. I. Du Pont de Nemours & Company, will talk on "Occupational Diseases Affecting the Textile Industry."

Dr. L. D. Bristol, Health Director, American Telephone & Telegraph Company, New York City, will talk on "Industrial Nurses"—Their Value to the Safety Movement."

Massachusetts Conference

THE Massachusetts Safety Conference, to be held May 6 and 7, 1935, at Hotel Statler, Boston, has the following program for its Section on Occupational Diseases:

May 6, 2 o'clock, P.M.

Chairman: Manfred Bowditch, Director, Massachusetts Division of Occupational Hygiene:

I. **The State Division of Occupational Hygiene.**
   - Introductory remarks by the Chairman.
   - The Chemical Work of the Division, Hervey B. Elkins, Chemist, Massachusetts Division of Occupational Hygiene.
   - The Engineering Work of the Division, Wm. Howard Lehmberg, Engineer, Massachusetts Division of Occupational Hygiene.
   - Discussion, led by Dr. Albert S. Gray, Director, Connecticut Bureau of Occupational Diseases.

II. **Toxic Vapors, Their Hazards and Their Control.**
   - Dr. W. F. Oettingen, Director, Haskell Laboratory of Industrial Toxicology. E. I. DuPont de Nemours & Company, Wilmington, Del.
   - Discussion, led by Philip Drinker, Associate Professor of Industrial Hygiene, Harvard School of Public Health.

A.P.H.A.

THE 64th Annual Meeting of the American Public Health Association will be held in Milwaukee, Wisconsin, October 7-10, 1935. This organization is a society of 4,500 professional public health workers whose annual sessions review developments in health protection and promotion and outline plans and policies for future advances.

Several related organizations have announced that they will meet simultaneously with the American Public Health Association at Milwaukee. They are:

American Association of School Physicians,

International Association of Dairy and Milk Inspectors,

Conference of State Sanitary Engineers,

International Society of Medical Officers of Health,

Association of Dairy, Food and Drug Officials,

Conference of Wisconsin Health Officers, and Conference of State Laborator Directors, and

Association of Women in Public Health.

The fourth Health Education Institute sponsored and conducted by the American Public Health Association will be held October 4, 5 and 6, prior to the opening of the several conventions.

The subject will be "Health Education in Small Cities and Rural Communities."

A Health Exhibit featuring commercial, scientific and educational displays is a feature of the American Public Health Association Annual Meetings and will be conducted as usual at Milwaukee.

The Journal of Industrial Hygiene

With Abstract of the Literature

(17th Year)

American Editor: DAVID L. EDSALL, M.D., S.D.

British Editor: E. L. COLLIS, M.D., M.R.C.S.

The physician employed by a mining or manufacturing concern or any large commercial or service institution is valued not only for his ability to treat injured or sick employees, but most of all for his knowledge of the various hazards to which employees are or may be exposed and his ability to institute effective preventive measures.

The Journal of Industrial Hygiene is international in scope, with a brilliant staff of associate editors in several countries. Issued six times per year it keeps the industrial physician and health worker thoroughly well informed as to deleterious conditions found in industrial plants throughout the world. Methods of detection, etiology, diagnosis, treatment, control and prevention are described by highly authoritative writers. Book reviews and concise carefully selected abstracts from the international literature are an invaluable feature in every issue.

The Journal is published in January, March, May, July, September and November. Quality and not quantity is the editorial standard. The annual volume consists of about 384 pages, and approximately 144 pages of abstracts. Single copies, when available, are $1.00 each. The subscription price is $5.00 per volume (foreign $5.50), and new subscriptions, payable with order, are entered to begin with the first issue of the current volume. *This is a good time to send your subscription.*

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The preliminary program plans include special session on The Role of a Health Department in a Program of Social Security, Mental Hygiene, Professional Education, Veterinary Public Health, Diphtheria Immunization, and a session upon the history and achievements of the Association's Committee on Administrative Practice, celebrating its 15th anniversary.

The 10 sections of the Association —Health Officers, Laboratory, Vital Statistics, Public Health Engineering, Industrial Hygiene, Food and Nutrition, Child Hygiene, Public Health Education, Public Health Nursing, Epidemiology—will discuss Pneumonia, Trench Mouth, Syphilis, Measles, Outdoor Bathing Places, Scarlet Fever, Milk Sanitation, Water Sanitation, Foods, Health Education, and many other topics representing the responsibilities of health authorities.

The Chairman of the Local Committee on Arrangements is Dr. John P. Koehler, Health Officer of Milwaukee. The American Public Health Association, at 50 West 50th Street, New York City, will be glad to send program outlines on request.

Special Libraries Association

THE Special Libraries Association will hold its 27th annual convention in Boston June 11-14, with headquarters at Hotel Statler. This rapidly growing organization has now a membership of over 1600 trained librarians who manage the libraries of industrial concerns, research laboratories, banks, business offices, newspapers, museums, law, medical, scientific, and other societies, as well as the specialized departments in large public, college and university libraries—in fact, any library devoted to one special field. The importance of trained library service to such special groups is now widely recognized and the Special Libraries Association devotes itself actively to the improvement of the methods and quality of such service.

The program of the coming meeting includes visits to the special libraries of Harvard University, Massachusetts Institute of Technology, and other special libraries in the Boston area, besides three general sessions and a large number of group and section meetings. The Science-Technology Group, with a membership of over 200, will hold three meetings. There will also be opportunity for visits to historic shrines in and near Boston.

International Physiological

IT IS estimated that between 200 and 300 medical men and scientists from the United States will attend the Fifteenth International Physiological Congress meeting in Leningrad and Moscow, August 8 to August 18, 1935. A short, inexpensive tour, closely packed with interest, has been officially arranged. Reservations for the tour and for attendance at the Congress may be made through the state medical journals for the groups sailing on the SS "Laconia" July 19 and on the SS "Berengaria" on July 25. Both groups will stop over in London and will have the opportunity, also, of attending there the Neurological Congress on July 29, 30, and 31.

A folder describing the expedition will be sent upon request. The present organization of state medicine in Russia is already a matter of world-wide interest to medical men and the tour should be a popular one. Dr. James S. McLester, president-elect of the A. M. A., Prof. A. J. Carlson, head of the Department of Physiology at the University of Chicago, and Dr. George Halperin, of **J. A. M. A.**, will accompany these groups to the Congress.

The physicians attending will be registered officially as members of the Physiological Congress and will enjoy all the privileges of such appointment. The Intourist has made remarkable concessions in matters of price, and doctors' families may accompany them on the same terms. The scientific features of the tour will include visits to hospitals, research institutions, clinics, children's homes, and homes for workers. In addition, there will be trips to museums, art galleries, theaters, and many typical new educational and cultural establishments.

From Moscow the delegations will proceed south to Yalta, the heart of the Crimea, visiting several great collective farms en route. A trip by boat along the coast of the Black Sea —the Russian Riviera—will afford the opportunity of viewing some of the most scenic spots in all Europe. The return trip will take the visitors through Warsaw, Berlin, and Paris.

Industrial Hygiene Activities

THE Baltimore City Health Department, through its Bureau of Environmental Hygiene, stands ready to assist any of the industrial organizations in the city in the investigation and solution of its health problems. While formerly it was customary for industrial plants to be reticent concerning plant sanitation and the health of their employees, a marked change has been noted in a number of instances since the establishment of the industrial hygiene service in the Health Department.

Two recent instances indicate a willingness and a desire on the part of industry to cooperate with the Health Department in improving health protective measures for employees. In one case recommendations were immediately put into effect for the prevention of a severe skin irritation from fruit acids, with favorable results. In the other, in a large industrial plant, insanitary types of drinking fountains have been replaced by approved models, and arrangements have been completed for the installation of foot baths in locker and shower-bath rooms for the control of ringworm of the feet.

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